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U.S. Committee on
Conservation...

Report of the Committee
on the Conservation...

Washington

1931

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REPORT
OF THE
COMMITTEE ON THE CONSERVATION
AND ADMINISTRATION OF THE
PUBLIC DOMAIN

TO THE PRESIDENT OF THE UNITED STATES

JANUARY, 1931

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COMMITTEE ON THE CONSERVATION AND ADMINISTRATION OF THE PUBLIC DOMAIN

Ex officio members:

Ray Lyman Wilbur, Secretary of the Interior, Washington, D. C.
Arthur M. Hyde, Secretary of Agriculture, Washington, D. C.

Chairman:

James R. Garfield, attorney; Secretary of the Interior during Roosevelt administration, Cleveland, Ohio.

Members:

I. M. Brandjord, commissioner of State lands and investments. Helena, Mont.

H. O. Bursum, former United States Senator, Socorro, N. Mex.

Gardner Cowles, publisher, The Register and Tribune, Des Moines, Iowa.

James P. Goodrich, attorney; former Governor of Indiana, Winchester, Ind.

W. B. Greeley, secretary-manager, West Coast Lumbermen's Association; former Chief of the United States Forest Service, Seattle, Wash.

Perry W. Jenkins, vice-president for Wyoming of the Great Lakes-St. Lawrence Tidewater Association, Big Piney, Wyo.

Rudolph Kuchler, president, State Taxpayers' Association of Arizona, Phoenix, Ariz.

George H. Lorimer, editor, Saturday Evening Post; vice-president, Curtis Publishing Co., Philadelphia, Pa.

Geo. W. Malone, State engineer of Nevada, Carson City, Nev.

Elwood Mead, Commissioner, Bureau of Reclamation (representing California), Washington, D. C.

Charles J. Moynihan, attorney, Montrose, Colo.

I. H. Nash, State land commissioner, Boise, Idaho.

William Peterson, director of experiment station and extension division, Utah State Agricultural College, Logan, Utah.

Mary Roberts Rinehart, author, Washington, D. C.

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Wallace Townsend, attorney; member of the Arkansas River Association, Little Rock, Ark.

E. C. Van Petten, president, Van Petten Lumber Co., Ontario, Oreg.

Francis C. Wilson, attorney; interstate river commissioner for New Mexico, Santa Fe, N. Mex.

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REPORT OF THE COMMITTEE ON THE CONSERVATION AND ADMINISTRATION OF THE PUBLIC DOMAIN

WASHINGTON, D. C., *January 16, 1931.*

To the President of the United States:

The committee appointed by you, in accordance with the act of Congress approved April 10, 1930, to make a study of and report on the conservation and administration of the public domain, respectfully submits the following report:

You have submitted to the committee problems for consideration which we summarize under five major topics:

1. The future disposition of the remaining vacant, unreserved, unappropriated public lands and the adoption of a definite program of conservation of grazing resources either through ownership or control by the States or by Federal administration.
2. The use and conservation of water resources including reclamation and flood control.
3. The conservation of subsurface mineral resources with respect particularly to the position which the States should occupy in any program.
4. The conservation of timber resources with special consideration of national forest areas, their usefulness within present limits, and the matter of additions to or eliminations from those limits.
5. Changes in administration which might produce greater efficiency in the conservation and use of the natural resources of the Nation.

Consideration of the questions submitted has led the committee to the following general conclusions and specific recommendations.

GENERAL POLICIES

It is the conclusion of the committee:

1. That all portions of the unreserved and unappropriated public domain should be placed under responsible administration or regulation for the conservation and beneficial use of its resources.

2. That additional areas important for national defense, reclamation purposes, reservoir sites, national forests, national parks, national monuments, and migratory-bird refuges should be reserved by the Federal Government for these purposes.

3. That the remaining areas, which are valuable chiefly for the production of forage and can be effectively conserved and administered by the States containing them, should be granted to the States which will accept them.

4. That in States not accepting such a grant of the public domain responsible administration or regulation should be provided.

5. We recognize that the Nation is committed to a policy of conservation of certain mineral resources. We believe the States are conscious of the importance of such conservation, but that there is a diversity of opinion regarding any program which has for its purpose the wise use of those resources. Such a program must of necessity be based upon such uniformity of Federal and State legislation and administration as will safeguard the accepted principles of conservation and the reclamation fund. When such a program is developed and accepted by any State or States concerned, those resources should be transferred to the State. This is not intended to modify or be in conflict with the accepted policy of the Federal Government relating to the reservation stated in conclusion No. 2 above.

SPECIAL RECOMMENDATIONS

1. That Congress pass an act granting to the respective public-land States all the unreserved, unappropriated public domain within their respective boundaries, conditioned, however, that in order to make the grant effective, the States desirous of accepting it shall so signify by act of legislation. A copy of the accepting act signed by the governor and attested by the great seal of the accepting State, when transmitted to the President of the United States, shall operate as an application for the clear listing of the lands granted, and the proceedings thereon shall follow under the direction of the

Secretary of the Interior, as in the case of selections heretofore made by public-land States under State land grants.

2. That for States not accepting the grant Congress shall include in the act a provision that upon the application of the State land commission, or State land commissioner, as the case may be, authorized thereto by the State legislature, the President should by Executive order designate the unreserved, unappropriated public domain in such State as a national range.

Existing laws and appropriations pertaining to the national forests should be extended to national ranges in so far as applicable, including grazing research and range improvements, and disposition of receipts, homestead provisions, and the prospecting for and utilization of minerals.

National ranges should include public lands withdrawn for mineral or other purposes when the use of the land for grazing is not inconsistent with the purpose of the withdrawal.

3. In the same act of Congress it should be provided that in the absence of legislation by any State within 10 years thereafter dealing with the control and administration of the unreserved, unappropriated public domain, the President, by Executive order, may establish, when authorized by Congress, a national range in such State, comprised of all such public domain, including lands withdrawn for mineral or other purposes whose use for grazing is not inconsistent with the purpose of the withdrawal.

4. Areas of unreserved and unappropriated public domain granted to the States shall be clear listed by the Department of the Interior in accordance with established procedure as to mineral or nonmineral character. In the case of lands classified as nonmineral in character, those passed to the States should be in fee simple, and pending the transfer of lands to the States the Federal Government should recognize in so far as possible any method inaugurated by the States to regulate the movement of livestock on such lands to prevent overgrazing that is not discriminatory between the States.

In the case of lands classified as mineral in character, title to the State should be in fee simple, except for the reservation in the United States of specified mineral or minerals found by the Interior Department to be present in the land at the time of clear listing, and with reservation in the United States, its permittees, lessees, or

grantees, of the right to enter upon the lands, to prospect for, mine, and remove such minerals.

5. There should be temporarily excepted from the grant the areas shown on map No. 1, submitted to this committee by the Forest Service, entitled "Areas proposed by Forest Service as additions to existing national forests or for establishment as new national forests." In order to determine what, if any, areas should be taken from or added to the national forests, a board should be created for each State composed of five members, one designated by the President of the United States, one by the Secretary of the Interior, one by the Secretary of Agriculture, and two by the State. The power and duty of such boards shall be: (1) To decide what, if any, lands within such proposed areas shall be added to the national forests; (2) to decide what, if any, areas within existing national forests shall be restored to the public domain; (3) additions to national forests should be limited to areas chiefly valuable for forest purposes, except upon request of the State involved; (4) the board shall endeavor to correct and round out the boundaries of national forests by the consolidation of areas wherever practicable; (5) the board shall report its findings from time to time to the Secretary of the Interior and complete its findings within one year from appointment of the board.

The committee recommends the use of map No. 1 merely as a basis for consideration of the board, not as an expression of opinion or suggestion that those areas be added to the national forests.

The committee believes that this method of procedure will expedite clear listing of the remaining lands.

Whatever areas are not included within a national forest as a result of the decision of the board shall then pass to any accepting State to be clear listed in the same manner as the general grant.

The board herein created shall be organized upon the passage of the act and any State may elect to defer acceptance of the grant in paragraph 1 until the determination of the board has been made.

6. The board should also be authorized to select additional reservations important for national defense, for reclamation purposes and reservoir sites, for national parks and monuments, and for migratory-bird refuges, and to recommend that they be set aside for the purposes indicated and be excluded from lands granted to any accepting State, and such recommendation when received by the

Secretary of the Interior shall have the effect of excluding such areas from the grant; provided, however, that the recommendations shall be filed with the Secretary of the Interior prior to the clear listing to the State of any of the land which might be so reserved.

If a majority of the board, or in the case of national defense, and/or for reservoir sites on interstate streams, two members thereof request that a definite area for the purposes stated in the preceding paragraph be excluded from the clear listing of any tract for further study to be given the subject, then the Secretary of the Interior shall exclude such definite areas from the clear-listed lands.

This board shall also have the power and it shall be its duty to make recommendations to the Secretary of the Interior for the elimination of lands from existing reservations, withdrawals, and classifications when such action is deemed proper by the board.

7. Areas restored to the unreserved and unappropriated public domain through the cancellation of any rights or claims or release of withdrawals should be subject to adjudication and clear listing or reservation, as herein provided.

8. The Secretary of the department having jurisdiction over any of the lands classified and disposed of as herein provided and remaining in public ownership should be authorized to exchange any of such lands with States or private owners for other lands of equal value with a view to consolidating ownership for more effective utilization and administration. In the making of such exchanges long-standing priority of use of grazing areas should be given due consideration and no exchanges completed until after full hearing has been accorded. Similar authority should be extended by an enabling act to the States as to any public lands granted thereby, and also as to any lands granted to the State by previous enabling or other acts.

9. In order to bring about the consolidation of existing State holdings within the States not accepting the general grant, so that administration and control may be more efficiently exercised, the State should be authorized, in the discretion of the Secretary of the department having jurisdiction thereof, to select any isolated area not in excess of four sections of the unreserved, unappropriated public domain, such as consolidated with near-by areas of State-owned lands, would effect the purpose mentioned; and upon clear listing of such selections, title should then pass to the State as in the case of other State land grants.

10. The Secretary of the Interior should be authorized to clear list areas previously withdrawn for the protection of stock-watering places and areas withdrawn for stock driveways upon a showing by the State that they are no longer required.

11. As to all grants provided for in the act, the land should pass to the States impressed with a trust for administration and rehabilitation of the public domain and for public institutions and with such restrictions as Congress might deem appropriate.

The following general restrictions are deemed desirable:

(a) The lands passing to the several States under the provisions of this proposal shall be subject to lease, sale, or other disposition as the State legislature may determine; provided, however, that all sales of such lands shall be made only at public auction after previous advertising and with reservation of subsurface minerals.

(b) None of such lands, nor any estate or interest therein, shall ever be sold or leased except in pursuance of general laws providing for such disposition.

(c) All proceeds arising from the sale or other permanent disposition of the lands and every part thereof shall be placed in a permanent fund to be safely invested and to be guaranteed by the State against diversion or loss.

12. The present conservative policy of reclamation development should be continued. Under it, construction expenditures each year are restricted to the payments from settlers and the income from other sources provided for in the law. If payments are not made, works will not be built. This makes of reclamation a sound business policy and is a strong influence toward maintaining the integrity of the contracts.

Where projects require a larger investment than can be met from the reclamation fund, they should be dealt with by Congress in special acts similar in character to the Boulder Canyon project act.

We recommend that, in the undertaking of any project, there should be no interference with the laws of the State relating to the appropriation, control, or distribution of the water or with vested rights secured thereunder.

Past experience, coupled with the urgent need of additional funds for accelerating and continuing construction work on irrigation projects, points conclusively to the desirability of adopting a definite

policy relative to hydroelectric development, under which the power receipts should be used; first, to repay the cost of the power plant and appurtenant works; second, the cost of the reservoir and dam which regulates the delivery of water to the plant; and after that, all net revenues should be credited to the reclamation revolving fund.

The policy should be continued of having a central organization to design and build works, but to transfer these works to the control and management of the water users as soon as the projects are settled and developed.

13. We approve and adopt from the Report of Committee of the Irrigation Division of the American Society of Civil Engineers made October 4, 1928, the following:

"The conservation of the water in the rivers and lakes of the country should be under public control and in order to lay a proper foundation for the making of comprehensive plans the Federal and State Governments should gather data, compile statistics, and conduct studies necessary to determine the feasibility of projects.

"The regulation of the flow of streams for the prevention of floods and for the best possible utilization of the waters should be undertaken by the States, or jointly by the United States and the States under such suitable forms of cooperation as may be appropriate under the constitutional authority now delegated to each. They should prepare and adopt comprehensive plans for such regulation and should bear an equitable portion of the cost of water-storage and flood-control work when the economic aspects after full investigations are found to be favorable, and the remainder of the cost should be allocated to flood-control, irrigation, power-development, municipal water-supply, and other purposes.

"Where protection against flood waters results from the regulation of stream flow by means of reservoirs or otherwise, the proportion of the cost of the flood-control work not assumed by the Federal or State Government should be assessed against the lands and other properties which receive benefit therefrom."

14. Whatever be the method adopted for the use and disposition of the public domain, any final administrative act must be based upon a survey of the areas involved. It is therefore recommended that the Congress be asked to provide appropriations sufficient to enable the General Land Office to proceed immediately with the survey of the remaining unsurveyed areas.

15. In the administration of the public domain as a national range it is recommended that consideration be given to those methods

which will perpetuate the best interests of the livestock industry, including long-time permits for grazing, and developing watering holes to permit the complete use of the range. The program should include consideration of a year-round permit system allocated so as to make the best use of the entire grazing areas of the State.

Careful consideration should be given to those areas vital for both grazing and watershed protection to the end that both interests receive constructive administration.

16. That the present ratio of participation by the Federal Government in the construction of Federal-aid highways be continued for a period of 10 years.

17. The location and protection of stock driveways should be given immediate consideration. Pending the determination of the extent to which they should be transferred to the States accepting the grant, cooperative action between the Federal Government, the States, and the stock-raisers' associations as to use, location, and policing should be entered into where possible. Interstate driveways should be retained in the Federal Government and held subject to use determined by interstate agreements.

18. We adhere to the principle that in all matters clearly involving the interest of two or more States, but not that of the other States of the Union, all questions arising therefrom should be settled by agreement and compact so far as possible and not by Federal intervention, save an appeal to the courts where necessary. This principle has proved very effective recently and should be more frequently resorted to in the future.

19. It is the conclusion of the committee that as to agricultural and grazing lands, private ownership, except as to such areas as may be advisable or necessary for public use, should be the objective in the final use and disposition of the public domain.

20. In order to provide for a more effective administration of the public domain and the various reservations and areas now under the control of the Federal Government and to promote the conservation of natural resources, it is recommended that the Congress be asked to authorize the President to consolidate and coordinate the executive and administrative bureaus, agencies, and offices created for or concerned with the administration of the laws relating to the use and disposition of the public domain, the administration of the national reservations, and the conservation of natural resources.

GENERAL DISCUSSION

The general work of the committee has been as follows:

At the first meeting in June, 1930, the general scope of the problem was submitted for consideration and provisions were made for obtaining from the departments of the Federal Government and from the public-land States all available information on the various subjects.

During the summer of 1930 certain members of the committee examined special portions of the public domain covering approximately 9,000 miles by automobile.

During November, 1930, the committee was in session in Washington, D. C., studying the material which had been collected.

Widespread interest, developed by reason of the appointment of the committee, resulted in the adoption of resolutions by various organizations interested in the disposition of the public domain and the presentation of numerous suggestions by individuals.

During its sessions the committee has had the advantage of many hearings with representatives of the Federal Government and the States on each of the questions under consideration.

THE PRESENT VACANT, UNRESERVED, UNAPPROPRIATED PUBLIC LANDS

Originally the United States owned, exclusive of Alaska, 1,441,436,160 acres of public lands, of which on June 30, 1904, there remained, unreserved and unappropriated 473,836,402 acres. Since that date, grants to newly admitted States, entries under the various homestead laws, and other disposals, reservations, and withdrawals have reduced that area until on June 30, 1930, there were, subject to entry under all applicable public-land laws, 178,979,446 acres, distributed, by States, as follows:

Area of vacant, unappropriated, and unreserved public lands

State	Area, in acres			State	Area, in acres		
	Surveyed	Unsurveyed	Total		Surveyed	Unsurveyed	Total
Arizona.....	8,084,880	7,096,000	15,180,880	New Mexico.....	14,316,481	1,347,640	15,664,121
Arkansas.....	190,969	.....	190,969	North Dakota.....	146,505	.....	146,505
California.....	11,284,395	5,339,093	16,623,488	Oregon.....	12,976,725	92,411	13,069,136
Colorado.....	6,825,425	1,202,043	8,027,468	South Dakota.....	430,880	.....	430,880
Florida.....	12,245	6,652	18,897	Utah.....	12,378,068	11,503,377	23,881,445
Idaho.....	8,765,491	1,852,471	10,617,970	Washington.....	905,382	14,292	920,584
Minnesota.....	189,847	.....	189,845	Wyoming.....	15,185,722	743,788	15,929,460
Montana.....	6,510,935	10,740	6,501,677				
Nevada.....	22,629	.....	22,628	Grand total.....	128,301,262	40,678,180	178,979,446
Nevada.....	30,064,688	21,389,805	51,454,493				

This report deals with the future disposition of that remnant of a once vast domain.

The primary problem submitted by you to the committee involved the use and disposition of the surface of those public lands. However, the attempt to find an acceptable formula which would place those lands in some kind of much-needed public control and supervision inevitably led the committee into the fields of reclamation, national forests, flood control, power sites, reservations and with-



Sagebrush land on the public domain in Washington

drawals for minerals, including oil and gas and other nonmetalliferous resources, national parks and monuments, bird refuges and game preserves, Indian reservations, military and naval reservations, and in fact all of the multifarious governmental activities, both State and Federal, which are linked with the administration of the public domain. A brief review of the extent to which those activities would be affected by the definite recommendations of the committee is essential to a complete understanding of the reasons therefor.

From the year 1785 to the present time, the end and aim of all congressional action concerning the public domain has been twofold: First, to enact laws under which homemakers would be enabled

to settle upon the land and build permanent homes and communities which ultimately would grow, politically speaking, to a point when the responsibilities of statehood could be assumed; and second, to conserve for the Nation those natural resources, both irreplaceable and recurrent, which are essential to the national welfare, present and future.

THE HOMESTEAD LAWS

The wisdom of the policy of so framing legislation as to bring about the settlement of the wilderness areas and the creation of addi-



Desert land in Arizona

tional States beyond the frontiers of the original thirteen States can not be questioned. The question now is whether that policy has so fully served the purpose for which it was framed as to make it no longer useful as applied to the remaining unappropriated, unreserved public domain. From an examination of homestead legislation since 1862 to the present time, in conjunction with the entries thereunder, some light may be thrown upon the appropriate answer.

After the passage of the act of May 20, 1862, final homestead entries annually increased, with minor ups and downs, until they reached the maximum in 1913 of 53,252, removing that year from the unreserved, unappropriated public domain 10,009,285 acres; but

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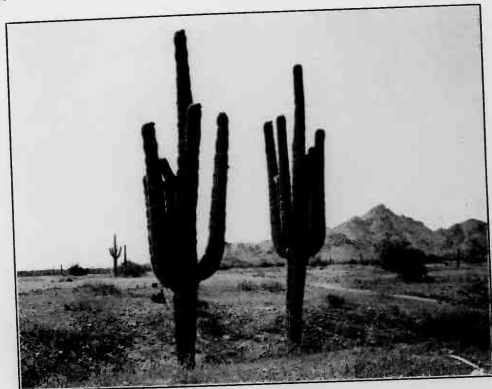
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the decline since that date has been fairly consistent until, in 1929, the entries numbered only 6,240, and the area embraced was but 1,700,950 acres. The conclusion must be that the remaining public domain subject to entry is attracting a rapidly decreasing number of homemakers, it being generally unsuited for permanent settlement.

Without attempting to detail the story, the same general conclusion can be derived from the figures as to the entries under the desert land act of March 3, 1877, and the timber and stone act of June 3, 1878, which is apart from the fact that abuses have arisen under both acts, rendering their usefulness to effect the purpose of Congress in enacting them most questionable, suggesting that modification, if not repeal, is desirable.

The number of 640-acre stock-raising homestead entries patented rose rapidly from 21 in 1919 to 8,399 in 1922, and then gradually declined until 1930, when 2,530 went to patent. However, some indication of the high percentage of failure and disappointment to the settler who has undertaken this form of homestead may be derived from the disclosure that during the 12 years since the stock-raising homestead act went into effect, less than half of the 133,350 entries have gone to patent. There are extensive areas in every public-land State which have been entered under this act and then abandoned to Russian thistle and other weeds, some poisonous, destructive to ranges formerly valuable to the stock raiser. Ruined fences and abandoned homes dot the landscape for many miles, pitiful evidence of human hopes buried beneath the economic insufficiency of 640 acres in a semiarid section as a stock-raising unit to support a family. It is not fair to our ex-service men and other home seekers to continue in effect an act which has resulted in so many failures and so much misery to settlers. At least it can be stated that little of the land not now entered holds out any hope of economic sufficiency for the permanent establishment of a family on 640 acres unless there is considerable adjoining grazing on the public domain. The uncertainty of the future as to that feature renders a venture on the strength of it perilous indeed. The Federal Government should cease to be a party to the inducement.

GRAZING

The surface of the public domain is now and always has been a great grazing commons, free to all comers. It is unlawful to fence

the land, and no public control has ever been exercised over it. For years recognition has been general that this has not been a wise use of it. To-day overgrazing has taken its toll in the form of large areas unfit for grazing, or a greatly reduced carrying capacity for livestock generally. Erosion has been increased by the destruction of forage cover, and the silting of stream and river flow as an aftermath has added to the problems of range and farm and reclamation. The damage done may never be wholly repaired nor yet its progress



Sheep grazing on the public domain

wholly arrested; but as a continuing evil it may be diminished, and by proper scientific treatment and regulation many ranges may be steadily improved and carrying capacity increased.

The immediate as well as the ultimate use of the public domain for grazing purposes is a matter of grave national concern, because of the fact that upon that area enormous herds of sheep, cattle, and horses are raised. It should be remembered that about 50 per cent of the sheep and 16 per cent of the cattle of the United States are raised in the public-land States. Hence any serious depletion of the ranges upon which these herds graze is of direct concern to all the people of the United States.

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The number of 640-acre stock-raising homestead entries patented rose rapidly from 21 in 1919 to 8,399 in 1922, and then gradually declined until 1930, when 2,530 went to patent. However, some indication of the high percentage of failure and disappointment to the settler who has undertaken this form of homestead may be derived from the disclosure that during the 12 years since the stock-raising homestead act went into effect, less than half of the 133,350 entries have gone to patent. There are extensive areas in every public-land State which have been entered under this act and then abandoned to Russian thistle and other weeds, some poisonous, destructive to ranges formerly valuable to the stock raiser. Ruined fences and abandoned homes dot the landscape for many miles, pitiful evidence of human hopes buried beneath the economic insufficiency of 640 acres in a semiarid section as a stock-raising unit to support a family. It is not fair to our ex-service men and other home seekers to continue in effect an act which has resulted in so many failures and so much misery to settlers. At least it can be stated that little of the land not now entered holds out any hope of economic sufficiency for the permanent establishment of a family on 640 acres unless there is considerable adjoining grazing on the public domain. The uncertainty of the future as to that feature renders a venture on the strength of it perilous indeed. The Federal Government should cease to be a party to the inducement.

GRAZING

The surface of the public domain is now and always has been a great grazing commons, free to all comers. It is unlawful to fence

the land, and no public control has ever been exercised over it. For years recognition has been general that this has not been a wise use of it. To-day overgrazing has taken its toll in the form of large areas unfit for grazing, or a greatly reduced carrying capacity for livestock generally. Erosion has been increased by the destruction of forage cover, and the silting of stream and river flow as an aftermath has added to the problems of range and farm and reclamation. The damage done may never be wholly repaired nor yet its progress



Sheep grazing on the public domain

wholly arrested; but as a continuing evil it may be diminished, and by proper scientific treatment and regulation many ranges may be steadily improved and carrying capacity increased.

The immediate as well as the ultimate use of the public domain for grazing purposes is a matter of grave national concern, because of the fact that upon that area enormous herds of sheep, cattle, and horses are raised. It should be remembered that about 50 per cent of the sheep and 16 per cent of the cattle of the United States are raised in the public-land States. Hence any serious depletion of the ranges upon which these herds graze is of direct concern to all the people of the United States.

Upon the point that some form of regulation of the range is an immediate necessity there is no room for disagreement. The only question is as to the agency which shall be charged with the duty of regulation and the development of the range.

Two methods for dealing with this problem have been suggested:

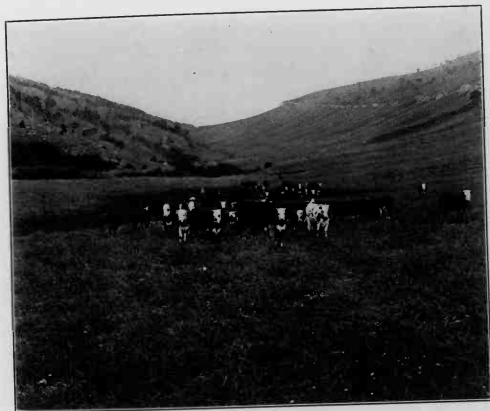
1. The transfer to the States of the public domain within their respective areas, reserving to the Federal Government such subsoil mineral resources as are now reserved in the Federal Government, together with such additions to the existing reserves and withdrawn areas as may be determined upon prior to the date of transfer of the lands to the States accepting the obligation, and pending such transfer the recognition in so far as possible of any method inaugurated by any State to regulate the movement of livestock on such lands to prevent overgrazing that is not discriminatory between the States.
2. The creation out of the public domain of a national range, to be administered by the United States.

The transfer of the public lands to the States would mean that each State would be charged with the sole obligation of conserving and using the range. The experiences of the public-land States in dealing with the large areas now owned by those States and suitable for range show that in many instances this administration has been effective and salutary. It is true that the public-land States, as their development increases, are becoming increasingly conscious of the value of conservation. The mistakes of the past and the lessons to be learned from that history have not escaped them.

The establishment of national ranges would mean the inclusion of definite areas of the public domain into national ranges to be administered by some Federal agency. The development of the existing Federal regulation by the Forest Service of grazing areas within national forests was a necessary incident to forest regulation under the conditions existing at the time the forest reserves were created. In many instances the grazing areas are so mingled with forest areas as to make their regulation as a unit necessary or advisable. The results of this administration show that regulation has been beneficial to the improvement of forage cover and grazing use. This does not mean that such administration has been free from difficulties or criticisms. It is recognized that any plan of regulation can not be made entirely satisfactory under all conditions. However, it has

proved that under such regulation the conservation of the range, its betterment, and the checking of overgrazing and erosion can in a great measure be attained.

In the event national ranges are created, careful consideration should be given to the selection of the Federal agency to be charged with their administration to the end that they may be under a unified control of and under men who are intimately familiar with the con-



Range cattle on the public domain

ditions of the ranges, wisely established customs of stockmen, the needs of contiguous areas, and the movement of herds and flocks from summer and winter ranges, regardless of political or topographical divisions.

In three areas range experimental stations have been established, either directly by the Federal Government or in cooperation with State authorities and private interests, where valuable experiments are being tried which show conclusively that the practical improvement of the range is thoroughly feasible. The livestock men of the West are familiar with the methods employed and the results which have been obtained under the program of continued supervision.

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Under whatever control the ranges may be, there will inevitably be conflicts or differences of opinion as to methods of regulation, and the amount of grazing charges. If, however, the regulating authority recognizes the principle of conservation as well as use, the differences of opinion will gradually disappear.

The public-land States which have adopted range-leasing systems are able to derive substantial revenues therefrom.

Montana, for the year ending June 30, 1929, derived an income of \$433,987.71; New Mexico, for the year ending June 30, 1930, \$318,525; Wyoming, biennial return of September 30, 1928, \$332,920.05; Arizona, approximately \$200,000; Colorado, for the biennial term ending November 30, 1928, \$642,023.56.

One of the major existing difficulties is due to the fact that there are many isolated tracts of the public domain scattered throughout areas containing State lands and private lands, including railroad sections. Hence under any of the methods it is apparent there should be the authority in both National and State Governments to provide for exchange of existing lands to the end that range areas may be consolidated in workable, compact bodies.

On some portions of the public domain the use of the surface has an important relationship to the conservation of run-off and the degree, or nature, of erosion. Broadly speaking, it is probable that the wise use and conservation of forage will accomplish as much in the conservation of run-off and checking of erosion as may practicably be attained. In areas of special importance, or where exceptional damage is taking place, special measures will be required, such as the elimination of grazing for a sufficient period to permit restoration of the natural cover.

In reaching the conclusions regarding range control, which are hereafter suggested, the committee has considered all of the special conditions existing in the various States, particularly those arising from topographic, climatic, and water conditions.

SPECIFIC PROBLEMS

In the event a State accepts the public domain within its areas, a number of problems arise. It is apparent that all rights must be protected and the proper forum provided for their definite determination before the transfer of title to a State. The problems in-

volve not only private interests but likewise the interests of the Federal Government.

In case the public domain in any State is organized into a public range to be administered by the Federal Government, the State's rights in its school lands, both surveyed and unsurveyed, as well as special land grants, must be secured to the State.

The committee presents the results of its consideration of the problems above mentioned.



Waiting for irrigation water

RECLAMATION

The public-land States include that vast arid portion of our country where farming is not possible without irrigation. Congress early recognized this essential difference from the rest of the country where settlement under the homestead laws brought about full agricultural development, and enacted the desert land and Carey acts to supplement the homestead law. Under these laws, by private and community effort, the essential agricultural development of the West received its first impetus. The limit of development by private enterprise was reached when the low-water flow of the streams was all appropriated and it became necessary to provide storage of the floods

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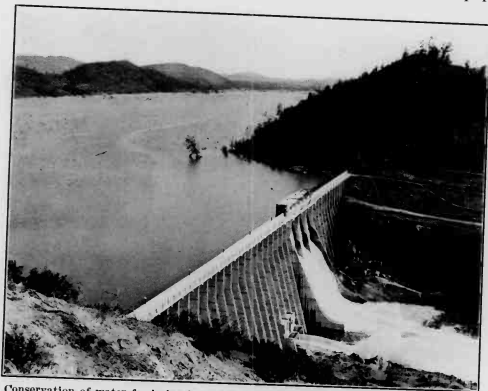
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to be held for use during the dry season. The high cost and long development period of these larger projects made them prohibitive from the standpoint of comparatively short-term investments, and many well-intentioned efforts in this direction resulted in total loss of investment not only by the promoters but by thousands of settlers as well.

This led to the enactment of the reclamation act designed to make possible in the arid States the building up of farm population and production in fair proportion to the steadily increasing urban popu-



Conservation of water for irrigation by the Stony Gorge Dam on the Orland project, California

lation of those States based upon mining, lumbering, and along the coast, shipping and industrial pursuits.

The reservation of certain vast resources within the Western States for future national needs is one of the major factors making it impossible for these States at the present time to finance their own reclamation requirements.

The reclamation act was originally conceived to supplement private enterprise by the construction or completion of projects beyond the resources of private promotions and individual or collective means. That conception rapidly grew and expanded until the theory

of the right of the United States as the proprietor of public lands to improve them by reclamation and irrigation was fully recognized and took form in the construction by the Federal Government of great reclamation projects devoted primarily to that purpose.

Although the development of Federal reclamation is of tremendous importance to the West, the value of crops grown on irrigated lands in these projects is only three-fourths of 1 per cent of the total crop value of the Nation.

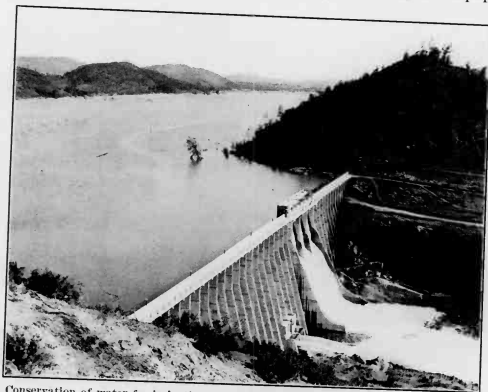
It is not within the scope of this report to detail the benefits to the public-land States and to the Nation which have flowed in ever-increasing measure from the adoption of that policy. Fundamentally it may be said that reclamation has surmounted the barriers of aridity, controlled and converted for useful purposes the menace of the flood, pushed back the frontiers of the desert, and subordinated them all to the service of the purposes of our forefathers in their efforts to establish permanent homes and prosperous communities on the public domain.

In the formulation of the policy of reclamation it was decided that the salable resources represented by the public domain should be drawn upon for the capital necessary for the program. Thus proceeds from the sale of public lands and 52½ per cent of the royalties derived under the mineral leasing act of February 25, 1920, are covered annually into the revolving fund for reclamation. From the former source since the passage of the act of June 17, 1902, to June 30, 1930, \$110,332,537.76, and from the latter source since February 25, 1930, to June 30, 1930, \$38,285,947.38 have been paid into that fund. In addition, \$59,360.35 has been received from the proceeds of Federal water-power licenses and \$68,296.51 from royalties and rentals from potassium deposits.

The additions to the fund from the sale of public lands in recent years have shown a trend to decline steadily until in the fiscal year ending June 30, 1930, this accretion amounted to only \$690,563.36, whereas the proceeds from the mineral leasing act for that year were three and one-third times and project collections almost nine times that amount. This is material in that it demonstrates clearly the comparatively insignificant part which the diminishing returns from the sale of public lands are destined to play in the future of reclamation.

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The reclamation of the arid and semiarid West is assuming proportions of increasing significance as knowledge and experience enlarge the useful field of our first endeavors and reveal the multiplicity of problems involved in the development and protection of every project. Drainage, colonization, flood control, erosion, power, and kindred subjects have in fact or should become major pieces in the mosaic which is now the Reclamation Service.

In order that no part which is important to the whole shall be omitted, the integrity of the reclamation fund must be guarded



An irrigated valley, the result of reclamation

carefully. Approximately 67 per cent of the annual income to the fund is from project collections, about 26 per cent from royalties under the mineral leasing act, leaving but 7 per cent from all other sources. The primary factor, then, is the safeguarding of project payments, and the secondary is the insurance of the future maintenance of accretions from the royalties received under the mineral leasing act in a percentage at least substantially as at present. The administrative policies of the Reclamation Service, if undisturbed, will assure the first, and nature has apparently undertaken to underwrite the second. Comparatively recent discoveries of great oil and gas fields in California and New Mexico, where a portion of the

public domain participates in their riches, should supply for years to come from permits and leases now in good standing the desired percentage. The public domain in Wyoming has been by far the greatest contributing area in the past and is at present giving promise of continuing that aid. The public domain in Montana, Utah, and Colorado has been and continues to be a hopeful prospect for the future. The immense deposits of coal in the public lands of the Western States, ranging in character from lignite to anthracite, and the deposits of phosphate, sodium, and potash constitute a resource from which future supplies of fuel and fertilizer materials may be derived for national use and will produce an increasingly large revenue. Thus any disposition of the unreserved, inappropriated public domain which does not disturb that desirable condition will withstand attack upon any theory of injury to reclamation.

Moreover, such disposition should be made with such reservations to the United States as may certainly provide for future projects when and as economic conditions justify the undertakings.

NATIONAL FORESTS

The growth of the idea of conservation has found expression in the most satisfactory degree in the protection of our western timber resources as administered by the Forest Service. There is great national pride in the success and in the efficiency of that service. There is no dispute as to the usefulness of the results. The extent, however, to which the activities of the service should be enlarged beyond areas valuable chiefly for forest cover or for reforestation raises a controversial question.

The committee has not attempted to furnish the answer except to the point of ascertaining the areas of the unreserved, inappropriated public domain in each State which might be added to the present national forests with beneficial results to the future administration and control of the areas thus added in conjunction with the present forests.

Extensive and extremely valuable reports, including maps, for each State have been submitted to the committee by the Forest Service. Roughly, the public domain has been divided by the Service into three classes: First, areas within each State which should be added to existing national forests or included within new national

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A scene in one of our National Forests

in acres, by ownership in each class are disclosed by the following table:

	Class 1	Class 2	Class 3	Total
	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>	<i>Acres</i>
Unreserved public lands.....	19,234,156	4,015,217	106,619,083	189,868,456
State.....	1,901,344	758,471	13,683,460	16,333,275
Private.....	13,685,038	26,448,161	70,966,972	111,620,171
Total.....	34,740,538	31,221,849	251,279,515	317,241,902

Without attempting to discuss details, it is sufficient to say that the committee did not deem class 2 as having sufficient value for the purposes for which it was classified to warrant consideration as a

wise use of the unreserved public domain included within it, and it is believed it should be included in class 3. Since this report deals elsewhere with the subject of the appropriate public control of class 3, it leaves only class 1 to be considered.

Accompanying the reports of the Forest Service were large maps, one each for the classes above given. The committee accepted map No. 1, representing class 1, as a graphic and accurate location of the areas covered by that class, and it is hereto attached.

Since both Nation and State are interested in the areas proposed to be added to the national forests shown by map No. 1, and equally so in areas now in the forests which admittedly are not useful for the purposes of the forests and thus could be eliminated from them, it was the conclusion of the committee that the grant to the States should not include the areas of the unreserved, unappropriated public domain shown on map No. 1, until a board, with representation for Nation and State, should have an opportunity to pass upon those points. Upon the determination of that board would depend the area out of class 1 which would ultimately pass to the State accepting the grant after following the course as to clear listing through the Interior Department, as elsewhere herein described.

PUBLIC PARKS AND MONUMENTS

Preservation of wilderness areas in their natural state, of archaeological and ethnological remains, and of unusual wonders of nature has resulted from conservation thoughts given practical form in the creation of public parks and monuments. It is the desire of the committee that the service should increase in usefulness and that its future growth be assured. The recommendations herewith have that intention in mind.

CLEAR LISTING OF NONMINERAL GRANTS TO THE STATES

In the past, original grants to the States have been limited to non-mineral lands. Such grants were of two classes: First, those in place, like the school sections, that is, numbered sections in each township for the support or in aid of common or public schools; and second, those not in place, which were in quantity and had to be selected by the State and clear listed through the General Land Office before taking effect in place. The process of clear listing involves the determination of the nonmineral character of the land,

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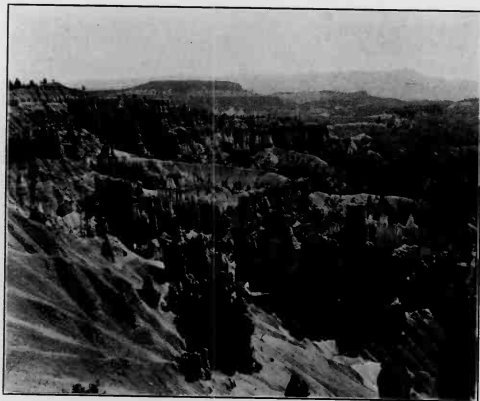
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CLEAR LISTING OF NONMINERAL GRANTS TO THE STATES

In the past, original grants to the States have been limited to non-mineral lands. Such grants were of two classes: First, those in place, like the school sections, that is, numbered sections in each township for the support or in aid of common or public schools; and second, those not in place, which were in quantity and had to be selected by the State and clear listed through the General Land Office before taking effect in place. The process of clear listing involves the determination of the nonmineral character of the land,

and if found to be mineral, the specific mineral, or minerals, if more than one, is reserved and does not pass to the State. If the land is clear listed without reservation of any mineral, unconditional title passes to the State, and if discovery thereafter is made the mineral developed belongs to the State.

The procedure for clear listing is thoroughly established as a result of many years of practice and precedent. The State makes a selection of lands and submits an application to the General Land Office



Bryce Canyon National Park, Utah

for clear listing with an affidavit that the lands selected are non-mineral. The filing of the application operates to withdraw the selected lands from the operation of all public land laws and to prevent the initiation of subsequent adverse claims. The application is submitted to the Geological Survey for report. If the land applied for, or some portion of it, has been classified by the survey as mineral, or valuable for some one or more minerals, the State is so notified and a date is set for hearing on the issue thus raised. If the State appears to contest the classification, the burden is upon the State to prove the nonmineral character of the land. If the burden is not sustained, the land does not pass to the State, or it may so pass if the

State will accept the title with a reservation of all minerals, or a reservation of such mineral, or specified minerals, as may be found to exist in the contested area.

In the event there is no existing classification in the Geological Survey at the time the application is presented, but the survey reports after application has been received that the land, or some portion of it, is probably mineral, or has some specified mineral or minerals, then the State is so notified and can appear to contest the finding, in which case the burden is on the United States to prove the existence of the mineral or minerals. If the United States fails to sustain the burden, then the lands are declared to be nonmineral, and they pass to the State as such; but if the United States prevails, the State has the option to accept or reject, as in the case above.

After the determination of the character of the land as mineral or nonmineral, and the extent of the grant to the State thereby determined, notice is given to all adverse claimants of the intent of the United States to pass title to the State and a date is set for hearing of such adverse claims as may be asserted. All claims are disposed of and the land selected, to the extent remaining, is clear listed to the applicant State.

In the case of school sections known to be mineral at the time of the grant title did not pass to the State unless it was willing to accept them with reservation of minerals in the United States. By the act of Congress approved January 25, 1927, the grants theretofore made of school sections were extended to those known to be mineral in character at the effective date of the act. Since the grants of school sections not known to be mineral at the effective dates of the several grants became unconditional thereafter, the act of January 25, 1927, had the effect of giving to the States a complete and unconditional title to all school-land grants, which, in the beneficiary States, amounted to an aggregate of 59,297,750 acres. To this acreage should be added areas selected by the States under general grants in quantity and for specific trusts, which have been clear listed in the General Land Office as nonmineral in character and have thus passed unconditionally to the States. The States have therefore had the experience of handling approximately 70,000,000 acres of land with no conditions or reservations attached to the title, an area more than half as extensive as the present surveyed, unappropriated, unreserved public domain within their boundaries.

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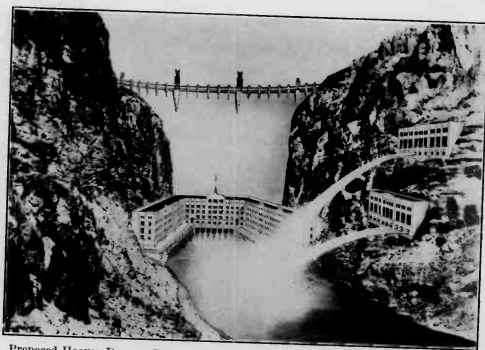
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FLOOD CONTROL

Mention has been made of flood control in connection with reclamation. Much has been accomplished by projects already constructed primarily for irrigation, and the Boulder Canyon project will reach the apex of achievement for the arid West in that respect. But the far-reaching benefits of each successful project in the protection of lands below the impounding works serve only to intensify recognition of the immensity of the field still unoccupied. None of the public-land States is free from the danger and devastations of floods; but



Proposed Hoover Dam on Boulder Canyon project will control Colorado River floods

the flood which wipes out a prosperous community or destroys an area in an agricultural district is a national and regional, as well as a State calamity, varying in importance only to the extent of the property destroyed and the number of lives wasted. Whether it be the Mississippi at flood with its dreadful potentialities, or the Rio Grande above the Elephant Butte, or the Colorado above Boulder Canyon after that project has been completed, or any stream in the West subject to the same destructive forces in flood time as are these great river systems, the principle that the problem of control is national and regional, as well as State, remains the same and should be recognized. It varies only in terms of solution, the difficulties, and the costs. It calls for cooperative measures between the Nation and the State, or

States, if more than one is benefited, and a just division of costs based upon an appraisal of the benefits received. As an incident to flood-control projects, the generation of power and the development of water for irrigation can be made to pay their part, but the frequent practice of the past of loading all the costs upon the shoulders of the landowner is inequitable and should be discontinued. Recognition of that principle appears in the Boulder Canyon project act.

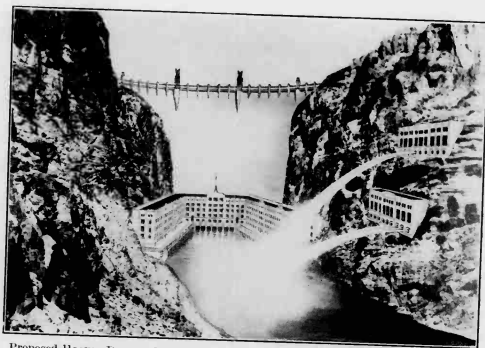
The policy should be enlarged to include all projects now under way or hereafter undertaken until a definite plan of Federal participation has been evolved. Reservoir sites on the public domain have already been located and reserved, and others should be, with a view to future requirements. On interstate streams such sites should be reserved in the United States until the States, by compact ratified by Congress, shall determine their position in the set-up agreed upon by that means.

Constitutional support for Federal participation in projects primarily for flood control might be found (1) in the interstate commerce clause, for the improvement of navigation where the watershed is on a navigable stream; (2) in the treaty-making power where the watershed is on an international stream in connection with which the United States has undertaken to fulfill a treaty obligation; (3) in the authority reserved to the States to enter into compacts subject to approval by Congress where the watershed is on an interstate stream the use of which has been made the subject of such compact approved by Congress, and necessarily involves a program of flood control for the protection of that use, or uses, especially where the Federal Government owns reservoir sites and rights of ways, instrumentalities essential to the prosecution of such a program; and (4) in the authority of the United States as a proprietor to construct irrigation projects for the improvement of its public lands where the watershed is above a project already built and flood control measures would protect that project from silt and other damage from uncontrolled floods.

The arid States of the West have adopted a system of water law peculiar to their necessities. The right to water depends upon appropriation for and application to a beneficial use, and the first in time is the first in right. All water not applied to a beneficial use

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belongs to the public, and no right to water may be initiated unless by authority of the agencies provided by the laws of the respective States for the administration of water resources. On interstate streams, as between States having that system of water ownership and public control, the Supreme Court of the United States has held that the same principles shall apply in the determination of priorities between users in different States. Vast property rights and the flourishing cities and towns of the arid States owe their existence to and have been built upon these cardinal principles which have been recognized by Congress. The use by the United States of water has been subjected to the laws of these States, in the reclamation act, the Federal water power act, and the Boulder Canyon project act. Flood-control measures should conform to the same policies and principles.

CONSERVATION

Conservation has been defined as wise use; but the definition does not satisfy, because what constitutes wise use is the subject of unending controversy. In retrospect we may readily detect the errors of our predecessors and to a limited extent correct them, but our prospective vision is clouded by the human limitations of life and mind. We do know that waste of any natural resource, whether it be one not replaceable because the alchemy of nature can not be duplicated, or one renewable by natural processes of growth and rebirth, is a wrong to the generations who will succeed us. The aim of each generation therefore should be to reduce waste to a minimum and to eliminate it where possible. At the least, conservation carries a mandate to that extent.

But there is a distinction between wanton waste and that which is not voluntary and results from imperfect and inefficient methods of production and utilization in industry and from overproduction. The first can be remedied by invoking the police powers of Nation and State; the second, only by the education of our people under an enlightened and courageous leadership. In the latter field the usefulness of the Federal agencies is not measurable by, nor dependent upon, nor confined to, the ownership by the United States of a relatively limited quantity of natural resources appertaining to the unreserved, unappropriated public domain. Rather should we think in terms of a practical idealism, relying upon a leadership with ample resources, marshaling the forces of research, of intelligent public-

ity, of wise instruction on the elimination of waste from production and fabrication, and on sound economics, leading the way to a clear understanding of the reasons why waste is the inevitable companion of the uncontrolled production of any natural resource when carried to an unusable excess above the normal requirements of the consuming public.

In every public-land State the United States is the owner of vast resources, surface and subsurface, outside of the vacant, unreserved, unappropriated public domain. Some idea of their extent may be afforded by the following:

	Acres
Areas in national forests (net).....	135,971,883
All minerals reserved (stock-raising homestead entries).....	56,134,312
Areas patented with reservation to the United States for oil, gas, phosphate, nitrate, potash, or asphaltic minerals.....	1,571,743
Areas patented with reservation of coal in United States.....	14,522,906
All minerals reserved in patented lands other than stock-raising homesteads.....	77,273
Lands certified to States with coal or other mineral reserved.....	617,815
National parks.....	5,935,912
National monuments.....	130,599
Gold, silver, and quicksilver reserved to the United States, in patented Spanish and Mexican land grants (estimated).....	2,040,881
Indian lands owned or controlled by the United States.....	70,993,326
Specific withdrawals:	
Coal lands.....	29,825,444
Oil lands.....	5,183,096
Oil shale (specific).....	156,147
Oil shale (general, estimated).....	4,000,000
Phosphate.....	2,004,765
Potash.....	9,411,939
Power sites.....	6,587,865
Public water.....	419,329
Reservoir sites.....	254,050
Helium.....	12,255
Reservoir sites (Arizona, New Mexico, and Oregon).....	1,074,550
Reclamation.....	19,034,330
Miscellaneous.....	7,068,027

Withdrawn areas may include State and privately owned lands; but lands other than Federal are usually less extensive than the areas owned by the United States, which, however, are to some extent duplicated in the figures given. In both cases it is impossible to give the net area belonging to the United States; but it is safe to venture the assumption that, generally speaking, control over natural resources in the withdrawn areas will be exercised by the United States.

The table discloses the national resources, more or less certainly defined, outside of the remaining unreserved, unappropriated public domain. The existence of mineral resources in the public lands generally results in the withdrawal or reservation of such lands, and thus their removal from the unreserved, unappropriated public domain. It follows that theoretically at least what remains unappropriated and unreserved at this time is for the most part non-mineral in character. An important exception probably exists in the presence of oil and gas beneath the surface of a relatively small



Blackfoot Indians on the shore of Two Medicine Lake, Glacier National Park

area of the present public lands. Most of the promising area is now covered by permits to prospect for oil and gas issued by the Interior Department under the mineral leasing act of 1920, and would be excluded in any grant to the States through the clear-listing processes of the General Land Office. In effect the areas covered by permits are withdrawn from the public domain so long as they are in good standing. On June 30, 1930, there were 676 oil and gas leases and 6,482 permits to prospect for oil and gas outstanding, covering an estimated area of 15,000,000 acres.

From the standpoint of participation in conservation programs of the near future by the United States the last figure has vastly

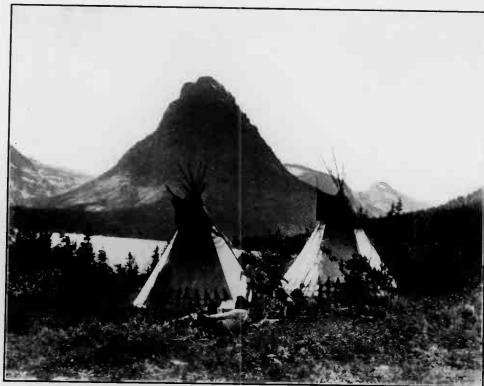
more significance than present withdrawals for oil and gas and oil shales. Present waste in the oil and gas industry can be laid to the door, largely, of overproduction. To bring about some measure of cooperation to reduce that dangerous factor, the prorating of pipe-line runs and the unit operation of a producing field have been suggested and are being tried out. Both methods promise relief if legal difficulties and individual instances of selfishness do not bar the way.

So far as leases issued by the Secretary of the Interior are concerned, following discovery by the permit holder or his assigns, the power to require the lessee to enter into prorating or unit-operation agreements is lost the moment the lease takes effect, and to that extent the control of the Federal Government over this important feature of any conservation program is gone. The committee suggests that if the mineral leasing act does not give sufficient authority to the Secretary of the Interior to include provisions in the lease reserving the right in him to require of the lessee, or his assigns, compliance with agreements for prorating of pipe-line runs, or for unit operation, as the case may be, of a field where two-thirds in interest of the operators in the field have so agreed, then the act should be amended to give him that authority.

The reason for the conclusion is that the permit gives only the right to prospect until oil and gas are discovered, whereas the lease gives the right to produce, and it is at the latter juncture that the danger point impends and should be averted if possible.

We have gone into the question of oil and gas conservation at greater length than might seem warranted, but the public interest is so great as to warrant some discussion of it in connection with any disposition which may be made of the unreserved public domain. Under present conditions, especially as to the permit situation as above stated, it is unlikely that the States accepting the grant would acquire much land valuable for oil and gas. The discussion therefore is not particularly pertinent to such grants except in so far as the example of the Federal Government would be valuable as a precedent for those States which now have the same or similar problems before them in connection with presently owned State lands.

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EROSION

In dealing with the conservation of the public domain it is recognized that erosion is playing an important part. In large areas erosion of the soil is shown to be more rapid than when settlement began. This is even serious in certain areas.

The balance, established by nature, between soil type, gradient, vegetative cover, and rainfall has been disturbed. There has probably been little change in rainfall during the past 100 years; the



One of the erosional actions of uncontrolled floods

gradient and soil type have remained the same. The greatest disturbance has been in the vegetative covers. Plant growth depends on plant food and moisture. The limiting factor in plant food is usually nitrogen. The nitrogen has its supply in the organic matter of the soil. The nitrifying bacteria live in this organic material and make available nitrogen. If the vegetative cover is grazed too closely, the annual organic contribution to the soil gradually grows less. The plants become stunted, even starved, and the better forage plants, such as grasses, give way to poorer plants, even poisonous plants. The multiple-root system of grasses is lessened. The partial sod cover is replaced by isolated plants. Less moisture is retained after each rainstorm. Nitrogen which is available for

plant food is soluble. More run-off means chemical erosion of plant food.

When the soil is denuded to this condition it will readily disintegrate. The surface is broken and gullying begins. Erosion is a problem associated with the hazards of floods and silting of streams and reservoirs. Whenever the amount of organic matter in the surface soil of any part of the public domain fails to maintain, erosion becomes a problem of conservation. Experiments indicate that from 10 to 15 per cent of the total plant growth of the year should return as an organic contribution of the soil, in order to maintain the forage cover. When the plants have been greatly denuded, it may take from 30 to 40 years under wise use to rehabilitate the area. The perpetuation of the plant food tied up in the organic matter of the upper soil determines the value in forage growth; measured in grazing it is as vital a factor in conservation as is the wise use of oils, gas, or mineral and if it could be measured with the same accuracy would show a value running into millions. The preservation of plant food, soil cover, and normal erosion is a problem in conservation on the public domain for future administration.

RESTRICTIONS ON STATE LAND GRANTS AND THEIR RESULT

Most of the State land grants have been made in trust for specific purposes, educational in the main, with certain restrictions surrounding them as to sale and final alienation, and as to leasing. From sales and royalties large permanent funds have been built up, from which the interest alone can be used for maintenance and operation of the beneficiary institutions, and considerable income from rentals and interest on contracts of sale is realized which is also devoted to such maintenance and operation. The benefits to most of the States have been very great, and the lands under their management have become in the main increasingly valuable for grazing and other purposes.

It should be remembered that in every instance the numbered school sections, which were grants in place and not selected, are found in every township, and thus are scattered throughout each State; but in the aggregate they constitute in each State by far the greatest proportion of the total land grant. When granted, they were in no better condition than the public domain surrounding

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them, from the surface of which the Federal Government has never derived any income and over which there has been no public control. In contrast, the States by leasing have passed the surface of their lands into private control, and have derived in round figures from that source for the support of common schools during their latest fiscal years—Montana, \$430,000; Colorado (biennial), \$584,000; Wyoming (biennial), \$275,000; Arizona, \$116,000; New Mexico, \$314,000; Washington, \$152,000; and Idaho, \$300,000. Some of the public-land States do not furnish statistics from which the foregoing information can be estimated, and thus they have been omitted.

It is noteworthy that from subsurface resources, including oil and gas, the public-land States named above derive a total annual rental and royalty revenue from their lands amounting in the aggregate to approximately \$2,500,000, which is more than half the income of the United States for the fiscal year ending June 30, 1930, under the mineral leasing act, which was \$4,739,095.67, of which \$1,009,373 came out of California, a State not included above.

STOCK DRIVEWAYS

The area withdrawn from the public domain and reserved for stock driveways, summarized on June 30, 1930, for the use of the committee, was 9,443,655 acres. The seasonal and other movements of stock pass over these great stock driveways. The withdrawals do not always, or have ceased in some instances, to serve the purpose for which they have been made, and without doubt some areas should be returned to the public domain. The usefulness of others has been destroyed, or impaired, by uncontrolled grazing not connected with the intended use of the driveways, and there has been no policing of them to prevent that abuse. Nevertheless most of them preserve rights of ways over the public domain, frequently interstate, for the passing of stock from winter range to summer range and for the return trip, which are essential to the stockmen. The national forests are the terminals of some, or the connecting link in others, and State lines are not barriers to the stockman using an interstate stock driveway.

It has been amply demonstrated before the committee that the driveways are important to the stock industry in the public-land States, but it has been made equally clear that their location is fre-

quently not adapted to their purpose and that lack of any sort of public control has greatly lessened their usefulness and value. Where they are interstate, it is doubtful whether they should pass to the State, and where they are intrastate but give access to national forests the control should be joint, the State and the Federal Government entering into cooperative agreement as to the handling of the facilities afforded by them and the policing of them to prevent trespass. The conclusion is that since a grant to the States of the unreserved, unappropriated public domain would not pass title to the stock driveways, the question of locations, regulation, and control of use should be taken up cooperatively with the States and stockmen's associations interested, with a view to improving conditions and a wiser use of these rights of way.

AGRICULTURAL AND RANGE EXPERIMENT STATIONS

There are several Government experiment stations where most valuable agricultural and range experimentation is being conducted either by the Department of Agriculture or the Department of the Interior. These stations should be continued, and where useful areas can be reserved for similar purposes, reservations should be created. It would be of value to the States accepting the grant if not in excess of a certain proportion of the income from the lands granted were specifically allocated in the granting act to the study by the States of range preservation and improvement.

In those States where public ranges are to be established it is recommended that range experiment stations now established be continued and as demand requires that new stations be so located as to afford data to the largest possible area.

MIGRATORY-BIRD REFUGES

Under the treaty with Canada covering migratory birds the United States has assumed jurisdiction over them. The Biological Survey has under way an intensive survey of the wild life of the United States, in the course of which refuges for migratory birds, in addition to those now in existence, will in all probability be recommended. Conservation of our wild life, including migratory birds, ranks with other efforts of the same character in connection with natural resources and calls for equal consideration. Grants to

the States should be safeguarded in that respect and the committee has included protective measures in the recommendations.

FEDERAL-AID ROADS

The following table shows the percentage payable by the Federal Government for the construction of Federal-aid roads in the public-land States.

Data for public land and nontaxable Indian lands

[Effective as to Federal-aid participation on October 1, 1928]

State	Ratio of the area of unappropriated land plus nontaxable Indian lands to the total land area of the State ¹	Percentage payable by Federal Government	Maximum Federal aid on basis of \$15,000 per mile	State	Ratio of the area of unappropriated land plus nontaxable Indian lands to the total land area of the State ¹	Percentage payable by Federal Government	Maximum Federal aid on basis of \$15,000 per mile
Arizona.....	0.5059	75.29	\$22,587	New Mexico....	0.2750	63.75	\$10,125
California.....	.2988	60.44	18,132	Oregon.....	.2447	62.23	18,699
Colorado.....	.1233	56.16	16,848	Utah.....	.5202	76.25	22,875
Idaho.....	.2125	60.62	18,186	Washington....	.0785	53.97	16,191
Montana.....	.1320	56.60	16,980	Wyoming.....	.3131	65.65	19,695
Nevada.....	.7770	88.85	26,655				

¹ Areas of unappropriated public land and nontaxable Indian lands as of June 30, 1928, were furnished by the Interior Department in a letter received Aug. 17, 1928.

The second table shows the changes in those percentages should all the public land be accepted by the various States. The committee is of the opinion that it would be proper to continue the present ratio for a definite period, even though some of the States accept the cession of public lands.

Federal-aid participation if public lands were not considered

States	Land area	Area of nontaxable Indian lands	Percentage of area of nontaxable lands to the area of the State	Percentage of cost payable by Federal Government
	<i>Square miles</i>	<i>Square miles</i>		
Arizona.....	113,310	28,145.3	25.0067	62.80
California.....	155,632	602.7	.3872	50.00
Colorado.....	103,658	724.6	.6990	50.00
Idaho.....	83,354	896.7	1.0758	50.00
Montana.....	146,131	8,058.0	5.5142	52.75
Nevada.....	109,823	1,148.6	1.0459	50.00
New Mexico....	122,503	7,339.4	5.9912	52.99
Oregon.....	95,607	2,423.7	2.5351	50.00
Utah.....	82,184	2,543.4	3.0948	50.00
Washington....	66,836	3,942.0	5.8980	52.94
Wyoming.....	97,548	3,190.6	3.2708	50.00

All the material considered by the committee is filed and readily available for examination.

Submitted with the report are appendices which are pertinent to certain facts stated.

Very respectfully submitted.

JAMES R. GARFIELD,
Chairman.

H. O. BURSUM.

FRANCIS C. WILSON.

I. M. BRANDJORD.

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MARY ROBERTS RINEHART.

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HUNTLEY N. SPAULDING.

JAMES P. GOODRICH.

E. C. VAN PETTEN.

WALLACE TOWNSEND.

GEORGE H. LORIMER.

APPENDIX STATE ACTIVITIES RELATING TO STATE LANDS

State	Has the State adopted a forest policy?	Has the State adopted a grazing policy?	Has the State adopted an irrigation policy?	Has the State adopted a policy for disposition of subsurface mineral, coal and oil, or oil shales?	Does the State sell its lands reserving subsurface mineral rights?	Has the State a policy for dealing with subterranean water flow separate from surface ownership?	Has the State a classification of its lands?	Has the State its separate system of land surveys or measurement of stream flow?	Through what administrative agency does the State administer its State lands?
Arizona	No	No	No	No	No	No	Yes	No	State land board.
California	Yes	No	No	Yes	Yes	No	Yes	No	Division of State lands, department of finance.
Colorado	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	State board of land commissioners.
Idaho	Yes	Yes	No	Yes	Yes	No	Yes	No	Do.
Montana	Yes	Yes	No	Yes	Yes	No	Yes	No	Department of State lands and investments.
Nevada	No	Yes	No	No	No	No	No	No	State engineer.
New Mexico	Yes	Yes	Yes	Yes	Yes	No	No	No	State land commissioner.
Oregon	Yes	No	Yes	Yes	Yes	No	No	Yes	State land board.
Utah	No	No	No	Yes	Yes	No	No	No	Do.
Washington	No	Yes	Yes	Yes	Yes	No	Yes	No	State land commissioner.
Wyoming	No	Yes	Yes	Yes	Yes	No	Yes	Yes	State engineer, State board of land commissioners, school land board.

- ¹ State supreme court has held that State has no right to do so.
- ² Subterranean water is subject to appropriation the same as surface water if running in well-defined underground channel.
- ³ Classified as grazing and agricultural land.
- ⁴ Since 1921 a study has been in progress, having as its object an inventory of State water and its development; exercises some control over organization of irrigation districts, issuance of bonds, and expenditure of bond funds; water storage and conservation districts subject to more or less of State supervision.
- ⁵ Disposed of by State in accordance with Statutes of California, 1921, Ch. 303.
- ⁶ Reserves one-sixteenth of all subsurface mineral rights.
- ⁷ Classified as suitable or unsuitable for cultivation.
- ⁸ For measurement of stream flow.
- ⁹ Except to provide appropriate legislation for administration of public waters and necessary legal procedure to make effective Federal statutes bearing on irrigation.
- ¹⁰ Reserved by State which issues leases on a rental and royalty basis.
- ¹¹ Except that artesian wells must be capped when water is not being used. Decisions in litigation have generally followed the appropriation doctrine.
- ¹² State-owned forest land, State-owned cut-over land, State land susceptible of irrigation, irrigated State land, State dry-farm land, State grazing land.
- ¹³ Although there is much legislation relating to irrigation and irrigation districts in general.
- ¹⁴ Mineral lands subject to lease on a royalty basis.
- ¹⁵ Land valuable only for grazing; land chiefly valuable for timber; agricultural land (irrigable and nonirrigable); land within the limits of a town or city or within 3 miles of such limits.

- ¹ No oil, gas, or coal has been found during past 15 years of drilling.
- ² No specific grazing regulations. Lands are leased for grazing and conserved by lessees.
- ³ All subsurface minerals are reserved in sale of State lands, and only surface rights conveyed.
- ⁴ Provision has been made for a classification but it has not been made because of great expense.
- ⁵ State measures flow of streams used for irrigation. Federal Government handles stream flow for power projects.
- ⁶ Although the Utah Water Storage Commission is the guiding force in general State irrigation activities.
- ⁷ State may not part with ownership, but may make leases.
- ⁸ Agricultural, arid, grazing, and mineral.
- ⁹ Half the cost of stream flow measurements by U. S. Geological Survey paid by State.
- ¹⁰ Under lease and payment of royalty.
- ¹¹ Agricultural, grazing, and timber.
- ¹² Measurements of stream flow made in part by the division of hydraulics, State department of conservation and development, but largely in cooperation with U. S. Geological Survey.
- ¹³ Land leased for grazing.
- ¹⁴ Cultivated agricultural lands, lands held as fallow, irrigated agricultural lands, irrigated pasture lands, grazing lands, and mineral lands.

GENERAL LAND OFFICE

TABLE 1.—Summary of disposition of the public domain

Land grants:	Acres	Acres
Canal construction—		4,597,668
Railroad construction—		
To corporations direct.....	93,968,521	
To States.....	38,204,704	
River improvement.....		132,173,225
States—		2,245,252
Agricultural college scrip.....	7,830,000	
Schools.....	78,179,737	
Swamp lands.....	64,805,651	
Miscellaneous.....	30,667,182	
Wagon-road construction.....		181,482,570
Other disposals:		3,296,658
Allotments to individual Indians.....		
Bounty land warrants located.....		27,062,933
Cash sales under timber and stone acts.....		64,062,374
Cash sales under various other acts.....		13,838,564
To June 30, 1880.....	196,755,216	
July 1, 1880, to June 30, 1904.....	179,803,004	
July 1, 1904, to June 30, 1930.....	34,812,116	
Coal entries.....		307,250,599
Desert entries.....		604,443
Homestead entries.....		9,827,299
Mineral entries.....		233,630,253
Miscellaneous dispositions, fiscal years 1905-1930, inclusive.....		3,113,372
Private land claims confirmed.....		4,182,777
Scrip locations.....		34,772,471
State reclamation land grants (Carey Act) patented.....		1,621,612
Timber culture entries.....		1,174,903
Reservations and withdrawals:		9,856,264
Indian reservations.....		
National forests, net area.....	70,993,326	
National parks and monuments in public-land States.....	135,882,603	
Federal reclamation projects.....	6,066,511	
Miscellaneous withdrawals and reservations.....	19,034,330	
Pending entries.....	22,775,790	
Vacant, unappropriated, and unreserved land, including Alaska ¹	22,533,574	
Total.....	1,868,764,547	
Total land surface in public-land States and Alaska ²	1,820,366,080	

¹ Includes 4,119,737 acres of desert land and coal entries.² The greater portion of Alaska being unsurveyed, the entire area of the Territory, land and water, 378,165,760 acres, has been used.³ The 48,398,467-acre discrepancy between this total and the total land surface in the public-land States and the land and water area of Alaska is due to the fact that in the very early days to record was kept by acreage but only by the number of the various classes of entries, and for the purpose of compiling the statistics from which this table was prepared each entry was considered as having been made for the maximum area; there is also some overlap in withdrawals; some of the land disposed of was afterwards reacquired either by cancellation of the entry and final certificate before patent was issued or by suits in the Federal courts to cancel patent; and also to the fact that within the exterior limits of withdrawals under the general reclamation act and in Indian reservations private holdings are scattered; and at this late date it is impracticable to attempt an adjustment of the apparent discrepancy.

APPENDIX

TABLE 2.—Number of stock-raising homestead entries and area of land entered during the fiscal years 1918 to 1930, inclusive

State	1918	1919	1920	1921	1922	1923	1924
Alabama.....	Number	Number	Number	Number	Number	Number	Number
Arkansas.....	Acres	Acres	Acres	Acres	Acres	Acres	Acres
California.....	275	104,001	325	138,016	471	213,376	157,225
Colorado.....	403	154,686	1,134	455,773	941	375,102	214,053
Idaho.....	2	569	2,587	1,000,288	2,138	712,790	618,604
Iowa.....	38	13,517	1,086	475,302	1,022	398,324	618,604
Kansas.....	8	27,784	45	6,252	21	5,079	234,673
Montana.....	896	314,512	2,917	1,015,928	3,883	1,286,300	482,610
Nebraska.....	28	6,758	84	13,944	52	10,152	1,480
Nevada.....	29	10,130	123	39,428	57	13,114	482,610
North Dakota.....	4,432	14,423	1,179	14,201	3,447	13,483	14,570
South Dakota.....	222	62,156	67	17,179	2,677	26,877	927,504
Oklahoma.....	73	14,413	135	55,029	48	1,134	627,434
Oregon.....	339	140,274	1,680	603,693	95	17,207	11,104
Utah.....	1,287	102,726	1,781	608,693	947	398,211	230,699
Washington.....	34	12,455	223	74,533	65	20,743	29,465
Wyoming.....	61	23,780	1,178	70,491	32	12,237	26,116
Do.....	275	46,125	297	108,734	248	78,470	30,736
Do.....	275	20,080	26	8,158	16	35,023	4,021
Do.....	3,094	1,882,454	6,573	2,706,128	3,135	1,636,921	8,880
Do.....	107	35,107	2,400	3,018,496	3,116	1,636,921	2,705,440
Total public lands.....	670	212,796	3,442	5,431,779	17,307	6,057,254	4,183,922
Total Indian lands.....	64	25,780	383	136,677	17,325	113,921	74,608
Grand total.....	734	238,576	3,825	5,568,456	34,632	6,171,175	4,258,530

TABLE 2.—Number of stock-raising homestead entries and area of land entered during the fiscal years 1918 to 1930, inclusive—Continued

States	1925		1926		1927		1928		1929		1930		Total	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Arizona	216	98,278	130	66,219	251	122,113	334	170,600	525	271,849	505	303,480	4,521	2,313,073
Arkansas	420	177,198	426	174,713	376	150,511	358	153,570	384	162,056	517	221,597	7,123	2,883,094
California	630	225,007	527	198,535	634	259,425	534	221,865	601	271,097	517	221,597	16,144	6,188,563
Colorado	169	73,005	158	73,469	173	81,831	141	72,762	173	90,823	297	155,489	1,818	862,780
Idaho	322	146,942	370	181,406	380	178,200	272	135,309	333	160,242	356	170,459	4,491	2,876,306
Kansas	24	3,066											233	38,407
Michigan	696	248,884	770	282,694	769	287,590	775	288,963	745	310,254	1,008	421,530	5	1,821
Montana	2	279	2	279	2	279	2	279	2	279	2	279	18,121	6,390,738
Nevada	11	11,337	24	4,055	17	3,701	19	3,406	32	7,141	26	4,000	33	8,713
New Mexico	892	38,157	878	380,490	1,089	409,921	1,206	605,406	1,583	808,027	2,039	1,013,365	783	490,216
North Dakota	18	4,979	24	8,528	14	2,640	21	5,594	5	1,328	4	918	27	6,767
Oklahoma	51	7,951	10	2,157	35	6,511	146	51,015	139	52,792	227	110,803	366	1,348
Oregon	377	148,445	244	98,406	127	42,420	16	5,170	19	6,589	17	52,792	7,355	3,052,450
South Dakota	130	54,662	172	52,788	245	103,445	218	100,573	248	118,615	227	110,803	6,346	2,151,331
Utah	11	4,190	16	4,377	16	5,170	19	6,589	17	52,792	25	7,857	967	384,431
Washington	290	133,494	414	238,272	402	218,882	302	174,540	464	266,485	366	213,062	4,096	2,210,410
Wyoming	58	30,157	39	14,410	22	8,476	20	7,525	7	2,601	17	8,409	1,126	373,420
General Land Office	1,203	509,103	974	444,551	1,357	601,185	1,394	712,850	1,920	986,065	2,192	1,061,763	33,229	14,247,417
Total public lands	5,416	2,217,383	5,070	2,170,028	5,771	2,571,646	5,704	2,667,302	7,060	3,465,727	8,172	3,933,811	133,330	54,810,555
Total Indian lands	197	80,656	184	80,457	210	92,138	174	83,820	208	101,282	348	171,309	3,212	1,323,757
Grand total	5,613	2,298,039	5,254	2,250,485	5,981	2,663,784	5,878	2,751,212	7,268	3,567,009	8,520	4,105,120	136,562	56,134,312

1 Ceded Indian lands.

TABLE 3.—Number of stock-raising homestead entries and area of land patented during the fiscal years 1919 to 1930, inclusive

State	1919		1920		1921		1922		1923		1924		1925	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Arizona	1	320	31	9,990	81	56,099	189	75,845	144	58,213	173	73,562	195	101,402
Arkansas			14	4,248	118	34,783	250	82,243	373	135,626	360	158,831	322	127,436
California	3	1,451	171	84,173	384	144,210	1,342	388,476	1,059	390,092	1,043	385,276	830	337,023
Colorado			27	6,701	106	30,379	173	55,645	165	61,192	257	85,359	294	91,121
Idaho	2	200	33	9,240	29	9,017	42	12,821	14	4,389	19	5,525	11	3,288
Kansas			111	29,940	329	144,199	972	328,416	951	304,255	935	325,155	967	327,807
Michigan					6	680	28	4,338	14	5,921	65	10,919	26	4,332
Montana							5	2,400	23	10,953	31	15,301	32	15,210
Nevada			319	87,376	794	233,353	1,222	451,778	1,133	431,319	1,271	516,003	1,625	616,019
New Mexico	10	1,597	61	18,788	72	16,965	47	14,345	49	15,267	50	15,272	16	6,947
North Dakota	3	751	8	4,788	8	4,402	16	3,782	37	3,841	21	5,210	8	2,786
Oklahoma			226	9,714	226	67,563	444	142,018	438	151,962	547	207,170	433	165,747
Oregon			229	98,399	611	169,745	738	217,690	444	141,762	586	207,021	440	154,467
South Dakota			4	778	4	778	23	10,677	14	6,522	57	27,623	63	32,306
Utah			68	16,358	62	16,358	62	19,408	68	32,493	82	24,001	73	25,011
Washington	2	630	377	110,497	1,063	324,392	2,946	1,110,020	2,406	867,063	2,250	873,731	1,715	696,200
Wyoming														
Total	21	4,908	1,411	47,066	4,299	1,249,593	8,369	2,919,820	7,393	2,560,759	7,767	2,932,138	6,416	2,567,122

State	1926		1927		1928		1929		1930		Total	
	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres	Number	Acres
Arizona	148	66,592	213	100,398	79	36,876	129	63,012	105	54,817	1,488	697,126
Arkansas	347	140,538	396	162,849	290	100,171	246	98,216	149	62,282	2,845	1,104,223
California	1,057	399,000	853	328,870	483	192,658	373	142,604	324	125,836	8,022	2,835,284
Colorado	323	120,262	280	112,028	127	51,968	160	69,915	137	60,512	1,967	751,022
Idaho	12	2,878	4	900	5	925	5	649	2	100	178	60,032
Kansas	962	313,335	1,139	370,112	660	220,984	552	195,060	450	160,685	8,168	2,710,628
Michigan	33	8,400	28	6,318	18	1,127	16	3,802	15	4,833	281	53,670
Nevada	33	10,776	42	20,090	26	13,637	25	13,613	26	13,613	14	3,065
New Mexico	852	351,537	1,079	459,649	541	237,043	625	287,216	442	194,539	9,313	3,668,029
North Dakota	27	7,814	14	4,816	15	5,137	12	2,508	17	3,585	983	100,895
Oklahoma	29	4,788	23	5,586	8	3,637	11	1,080	14	3,065	106	35,477
Oregon	306	150,031	361	149,541	136	53,384	141	54,472	118	52,577	3,379	1,249,489
South Dakota	450	151,764	272	83,955	183	69,956	145	48,461	104	36,890	4,212	1,324,292
Utah	112	55,997	144	73,514	96	49,309	97	52,772	114	61,499	724	370,727
Washington	82	24,370	80	27,582	49	17,769	50	14,256	33	8,769	686	210,656
Wyoming	1,084	648,574	1,223	495,870	785	338,860	683	301,636	479	217,981	15,323	5,985,304
Total	6,400	2,513,676	6,152	2,400,065	3,460	1,857,278	3,271	1,350,385	2,530	1,057,262	57,669	21,288,661

TABLE 4.—*Acceage of public lands surveyed and officially accepted during the fiscal years 1924 to 1930, inclusive, also total area surveyed and accepted on June 30, 1930*

State	Surveyed during fiscal year						Surveyed to June 30, 1930
	1924	1925	1926	1927	1928	1929	
Alabama	924,241	797,205	372,431	1,113,305	899,020	564,475	29,288,973
Arizona	381,330	128,343	85,460	148,069	21,035	124,017	68,250,440
California	535,853	330,429	382,276	346,059	337,660	34,455	2,128,280
Colorado	458,422	256,359	613,196	318,337	357,758	455,801	11,946,781
Idaho	798,221	272,245	428,473	679,862	101,128	22,264	23,008,855
Montana	944,043	745,660	386,689	378,331	158,269	115,680	5,728,069
Nebraska	226,256	131,162	45,198	378,331	158,269	31,337	14,538,743
Nevada	3,063,660	3,279,355	1,878,370	3,847,400	1,313,710	2,462,576	29,008,354
New Mexico	1,401	159	3,671	160	69	256	612,288,023
North Dakota	1,401	159	3,671	160	69	256	136,137,777
Ohio	17	584	23,108	3	14	4,453	33,615,000
Oregon	234	1,435	100	56	17	12	33,111,040
South Dakota	22,863	1,401	1,024,232	3,983,237	1,401	4,453	29,008,800
Texas	40	563	156	131	22,583	1,076	52,333,300
Utah	5,064,675	3,290,689	1,057,698	3,189,767	1,365,717	2,508,653	29,072,600
Washington	96,845	638	11,136	101,060	3,983,237	1,076	40,052,022
Wyoming	5,131,820	3,300,338	1,044,232	3,983,237	1,365,717	2,508,653	55,363,840
Total	4,411,628	1,102,986	1,133,986	1,179,315	3,983,237	1,076	1,302,919,045
Grand total							139,281,275
Result 1930							376,224,890
							1,304,839,946
							315,906,134

[This table includes all lands surveyed, whether reserved, withdrawn, or vacant and unappropriated]

This table represents surveys completed and placed with accompanying field notes officially accepted by the General Land Office as shown by the records thereof. The area of surveys reported by the supervisor of surveys was as follows: Original surveys, 3,338,320 acres; surveys made by the General Land Office, 1,051,520 acres. Surveys executed in the field during the latter part of the fiscal year 1929 will be placed and appear in the accepted returns of surveys for 1930.

TABLE 5.—*Cost of original surveys of public lands for past five years*

Year	Cost per mile	Total mileage	Year	Cost per mile	Total mileage
1925	\$19.58	24,342.7	1928	\$20.87	19,317.0
1926	21.49	19,965.0	1929	22.61	17,490.0
1927	21.46	17,877.7	1930	25.04	15,911.0

BUREAU OF RECLAMATION

TABLE 1.—*Accretions to the reclamation fund, repayments to the reclamation fund, and expenditures for construction and operation and maintenance of reclamation projects to June 30, 1930*

(1) State and project	(2) Accretions to reclamation fund to June 30, 1930	(3) Collections (repayments to reclamation fund) to June 30, 1930	(4) Total accretions and collections (column 2 plus column 3)
Alabama	\$60,127.13		\$60,127.13
Arizona:			
Salt River		\$9,686,842.98	
Yuma		\$7,754,744.24	
Yuma auxiliary		22,354.33	
Total	2,453,591.71	15,463,941.55	17,917,533.26
California:			
Orland		1,310,384.71	
Yuma		1,889,809.65	
Klamath		2,436,042.62	
Total	15,506,856.47	3,738,436.98	19,245,293.45
Colorado:			
Grand Valley		829,738.12	
Uncompahgre		2,833,911.04	
Total	10,410,861.78	3,663,699.16	14,074,560.94
Idaho:			
King Hill		130,224.99	
Mimidoka		12,224,190.17	
Mimidoka—Gooding division		296,400.94	
Owyhee		7,300,198.12	
Total	6,935,384.51	19,925,354.89	26,860,739.40
Kansas: Garden City	1,032,764.48	58,002.27	1,090,766.75
Louisiana	20,413.71		20,413.71
Montana:			
Huntley		1,203,682.09	
Milk River		639,723.98	
Lower Yellowstone		803,357.41	
Total	16,025,369.79	3,193,270.56	19,218,640.35
Nebraska: North Platte	2,063,754.36	\$5,747,732.44	7,811,486.80
Nevada: Newlands	996,298.37	2,082,824.91	3,079,123.28
New Mexico:			
Carlsbad		1,733,239.35	
Hondo		34,056.70	
Rio Grande		3,911,934.12	
Total	6,356,433.09	5,680,150.17	12,036,583.26

1 Interstate projects, expenditures for construction and for operation and maintenance partly prorated on an area basis.

2 Distribution between States of collections on interstate projects partly estimated.

TABLE 1.—Accretions to the reclamation fund, repayments to the reclamation fund, and expenditures for construction and operation and maintenance of reclamation projects to June 30, 1930—Continued

(1) State and project	(2) Accretions to reclamation fund to June 30, 1930	(3) Collections (repayments to reclamation fund) to June 30, 1930	(4) Total accretions and collections (column 2 plus column 3)
North Dakota:			
Burlington-Trenton		17,873.93	
Williston		901,706.47	
Lower Yellowstone ¹		234,882.48	
Total	12,276,579.13	844,122.88	13,120,702.01
Oklahoma	5,925,274.31		5,925,274.31
Oregon:			
Baker		5,879.29	
Umatilla		1,184,334.76	
Vale		21,929.57	
Klamath ¹		2,239,981.15	
Owyhee ¹		418,898.43	
Boise ¹		753,145.40	
Total	11,883,257.65	3,514,277.60	15,397,535.25
South Dakota: Belle Fourche	7,716,393.30	1,521,168.84	9,237,562.14
Texas: Rio Grande ¹		3,111,433.97	3,111,433.97
Utah:			
Strawberry Valley		2,166,204.22	
Salt Lake Basin		58,476.95	
Total	4,332,325.12	2,224,681.17	6,557,006.29
Washington:			
Okanogan		699,955.38	
Yakima		11,105,546.81	
Yakima—Kittitas division		70,618.77	
Total	7,416,855.95	11,876,121.16	19,292,977.15
Wyoming:			
Riverston		148,898.15	
Shoshone		2,134,648.15	
North Platte ¹		7745,238.27	
Total	37,234,020.79	3,026,804.57	40,260,825.36
All States:			
Secondary investigations		903,739.79	903,739.79
Federal water power licenses	59,360.35		59,360.35
Other collections (including general offices, Indian projects, etc.)		4,401,243.11	4,401,243.11
Grand total	148,736,142.09	91,596,996.02	240,333,138.02

¹ Interstate projects, expenditures for construction and for operation and maintenance partly prorated on an area basis.² Distribution between State of collections on interstate projects partly estimated.³ Levee maintenance reimbursed by or financed by General Treasury not included.

TABLE 1.—Accretions to the reclamation fund, repayments to the reclamation fund, and expenditures for construction and operation and maintenance of reclamation projects to June 30, 1930—Continued

(1) State and project	(5) Expended for construction of reclamation projects to June 30, 1930	(6) Expended for operation and maintenance to June 30, 1930	(7) Total expenditures to June 30, 1930
Colorado:			
Grand Valley	5,338,904.91	129,720.24	5,468,625.15
Uncompahgre	7,928,760.97	1,620,544.89	9,549,305.86
Total	13,267,665.88	1,750,265.13	14,417,931.01
Idaho:			
King Hill	1,905,318.80	156,734.25	2,062,053.05
Mimodoka	15,036,028.84	2,157,396.72	17,193,425.56
Mimodoka—Gooding division	1,860,818.49		1,860,818.49
Boise ¹	16,030,428.76	2,751,512.14	18,781,940.90
Owyhee ¹	762,330.55		762,330.55
Total	35,624,945.46	5,045,453.11	40,670,398.57
Kansas: Garden City			395,831.78
Montana:			
Huntley	1,562,302.99	1,014,943.79	2,577,246.78
Milk River	7,448,280.78	217,611.55	7,665,892.33
Sun River	7,185,721.71	309,163.41	7,494,885.12
Lower Yellowstone ¹	2,345,910.86	827,664.95	3,173,575.81
Total	18,544,216.34	2,364,383.70	20,908,600.04
Nebraska: North Platte ¹	14,953,360.92	2,656,484.64	17,609,845.56
Nevada: Newlands	7,956,917.16	1,453,490.54	9,410,407.70
New Mexico:			
Carlsbad	1,464,522.57	841,342.14	2,305,864.71
Hondo	381,573.39		381,573.39
Rio Grande ¹	8,547,138.33	1,610,779.70	10,157,917.83
Total	10,393,234.29	2,452,121.64	12,845,355.93
North Dakota:			
Burlington-Trenton	223,423.06	74,781.07	298,204.13
Williston	517,630.09	994,022.13	1,422,292.13
Lower Yellowstone ¹	1,291,223.38	441,446.48	1,932,669.86
Total	1,992,276.53	1,420,889.69	3,413,166.12
Oregon:			
Baker	68,334.79		68,334.79
Umatilla	5,157,937.30	680,725.82	5,838,663.12
Vale	2,638,738.61		2,638,738.61
Klamath ¹	3,715,708.82	1,079,338.71	4,795,047.53
Owyhee ¹	1,765,472.63		1,765,472.63
Boise ¹	32,125.10	28,000.60	60,125.10
Total	13,358,317.15	1,797,086.13	15,155,403.28
South Dakota: Belle Fourche	4,190,875.84	1,514,125.09	5,705,000.93
Texas: Rio Grande ¹	7,211,353.20	1,332,796.46	8,544,149.66
Utah:			
Strawberry Valley	3,519,935.39	437,856.39	3,957,791.78
Salt Lake Basin	2,365,024.51		2,365,024.51
Total	5,884,959.70	437,856.39	6,322,816.09
Washington:			
Okanogan	1,456,465.81	649,647.22	2,106,113.03
Yakima	14,509,186.64	4,298,112.29	18,745,309.93
Yakima—Kittitas division	6,583,745.47		6,583,745.47
Total	22,549,407.92	4,885,759.51	27,435,167.43
Wyoming:			
Riverston	3,835,484.30		3,835,484.30
Shoshone	9,752,118.45	911,740.50	10,663,858.99
North Platte ¹	5,206,657.03	95,486.48	5,302,143.51
Total	18,794,259.78	1,007,226.98	19,801,486.76
All States:			
Secondary investigations	2,900,836.52		2,900,836.52
Grand total	207,859,284.38	31,432,859.89	239,292,144.27

¹ Interstate projects, expenditures for construction and for operation and maintenance partly prorated on an area basis.

TABLE 2.—*Accretions to the reclamation fund, to June 30, 1930, from receipts under the mineral leasing act of February 25, 1920 (from oil and gas leases, coal leases, phosphate leases, and sodium leases in the public-land States)*

State	Oil and gas	Coal	Phosphate	Sodium	Total
Alabama.....		\$60,127.13			\$60,127.13
California.....	\$7,536,745.02	12.56			7,536,747.58
Colorado.....	166,973.10	153,525.09			320,498.19
Idaho.....	20,413.71	327.25	\$5,780.45		5,046.70
Louisiana.....	85,506.56	85,006.21			20,413.71
Nevada.....	85,733.43	12.10	61.00	\$3,413.25	910,946.07
New Mexico.....	32,879.12	3,496.55			3,496.55
North Dakota.....	64,473.90				118,612.55
South Dakota.....		381.38			64,473.90
Utah.....	17,859.21	204,015.61			381.38
Washington.....	28,595,279.72	415,040.31			221,374.82
Wyoming.....			32.01		14,518.97
Total.....	37,248,430.75	1,028,220.92	5,850.45	3,445.26	38,285,947.38
Potassium royalties and rentals (California).....					68,206.51
Total.....					38,354,243.89

APPENDIX

TABLE 3.—*Status of construction account repayments, June 30, 1930*

State and project	Construction account, June 30, 1930, payable	Value of repayment contracts	Amounts of repayments collected on June 30, 1930	Balance of repayment contracts (not due)	Amounts paid on amounts due	Amounts uncollected of amounts due	Per cent amounts due
Arizona: Salt River.....	\$10,166,021.97	\$10,166,021.97	\$5,806,292.77	\$4,359,729.20	\$5,286,120.64	\$900,601.22	83.7
Arizona-California: Yuma.....	2,356,485.44	2,356,485.44	5,703,314.19	1,778,028.76	5,286,120.64	18,338.55	97.4
California: Yuba.....	4,932,533.32	4,974,584.11	50,965.08	4,914,598.03	44,035.45	15,562.63	73.4
Colorado: Valley.....	5,466,773.15	5,510,871.31	707,771.71	4,803,099.60	469,277.04	218,494.07	69.1
Idaho: Klamath.....	16,124,392.08	14,698,000.12	3,411,821.39	11,286,178.73	3,467,185.08	4,306.31	99.9
Idaho: King Hill.....	12,489,528.34	11,409,813.82	7,284,633.25	3,553,166.57	7,238,084.34	53,868.91	99.3
Idaho: Uncompahgre.....	5,257,000.00	5,257,000.00	288,000.00	4,969,000.00	258,900.00		100.0
Montana: Milk River.....	1,830,895.88	1,893,895.19	582,638.91	1,271,107.28	532,638.91		100.0
Montana: Milk River.....	5,318,201.66	10,012,317.24	194,446.78	9,817,870.46	163,396.54	1,046.24	99.5
Montana-North Dakota: Lower Yellowstone.....	4,001,076.17	4,134,864.70	218,700.47	3,916,164.23	2,617,627.19	174,666.00	93.8
Nebraska-Wyoming: North Platte.....	3,884,696.67	3,230,275.05	2,967,781.11	2,222,486.04	2,865,618.56	2,102.55	99.8
New Mexico: Carlsbad.....	12,421,735.71	13,466,125.00	2,770,134.36	10,695,990.64	2,669,244.80	70,888.56	97.4
Oregon: Klamath.....	4,403,411.05	3,458,253.93	613,013.64	3,845,240.29	389,274.93	64,638.71	85.8
Utah: Unadilla.....	2,632,088.41	4,300,000.00	1,057,967.27	4,500,000.00	1,694,201.55	53,444.72	10.0
Oregon-California: Klamath.....	5,622,527.17	8,800,000.00	1,057,967.27	18,000,000.00	586,010.86		100.0
South Dakota: Badle Foursie.....	4,461,956.64	5,416,403.23	386,010.86				
Utah: Salt Lake Basin.....	2,317,085.04	3,000,000.00	1,102,641.85	2,109,458.72	1,692,367.85	10,374.00	99.1
Washington: Strawberry Valley.....	3,831,245.04	3,212,135.57					
Wyoming: Yellowstone.....	424,108.97	190,701.45	255,407.22		130,791.45		100.0
Yakima: Kittitas.....	6,562,906.31	5,900,000.00	6,000,000.00		5,000,000.00	193,082.43	100.0
Wyoming: Shoshone.....	3,814,292.47	5,883,614.27	781,232.29	4,894,381.98	780,725.75	506.54	99.9
Total.....	180,286,933.79	190,544,367.82	41,007,864.07	149,476,523.75	39,438,243.93	1,625,740.14	96.6

TABLE 4.—Summary of construction results to June 30, 1930

Item	To June 30, 1930	To June 30, 1929	Increase
Reservoir capacity available (original).....	<i>Acre-feet</i> 12,970,528	<i>Acre-feet</i> 12,881,963	<i>Acre-feet</i> 88,565
CANALS, DITCHES, AND DRAINS			
Canals over 800 second-feet capacity.....	<i>Miles</i> 563.8	<i>Miles</i> 564.8	<i>Miles</i> 29.0
Canals 301 to 800 second-feet capacity.....	744.6	729.1	15.5
Canals 50 to 301 second-feet capacity.....	2,334.8	2,334.8	0
Canals less than 50 second-feet capacity.....	9,605.1	9,469.1	136.0
Total canals.....	13,278.3	13,097.8	180.5
Waste-water ditches.....	1,096.5	1,084.0	12.5
Drains, open.....	2,378.3	2,146.4	231.9
Drains, closed.....	227.0	229.2	7.8
Total.....	3,711.8	3,459.6	252.2
Grand total.....	16,990.1	16,557.4	432.7
TUNNELS			
Number.....	124	122	2
Length (feet).....	176,700	175,536	1,164
STORAGE AND DIVERSION DAMS			
Masonry.....	<i>Cubic yards</i> 2,953,229	<i>Cubic yards</i> 2,915,740	<i>Cubic yards</i> 377,489
Earth.....	17,041,342	16,458,599	582,743
Rock-fill and crib.....	2,219,948	2,130,236	89,712
Total.....	22,212,529	21,504,575	707,954
DIKES AND LEVEES			
Length and volume.....	<i>Feet</i> 1,312,801	<i>Cubic yards</i> 7,205,359	<i>Feet</i> 1,285,691
			<i>Cubic yards</i> 6,865,765
			<i>Feet</i> 27,110
			<i>Cubic yards</i> 339,594
	Concrete	Wood	Concrete
			Wood
			Concrete
			Wood
CANAL STRUCTURES			
Costing over \$2,000.....	<i>Number</i> 1,635	<i>Number</i> 255	<i>Number</i> 1,380
Costing \$300 to \$2,000.....	3,730	1,145	2,585
Costing \$100 to \$300.....	20,017	11,608	8,409
Costing less than \$100.....	34,717	88,342	53,625
Total.....	60,119	101,350	41,231
Grand total.....	161,469	148,462	13,007
BRIDGES			
Steel.....	<i>Feet</i> 112	<i>Feet</i> 112	<i>Feet</i> 0
Combination.....	441	441	0
Wood.....	10,880	254,272	243,392
Concrete.....	431	5,832	5,401
Total.....	11,864	262,660	250,796
CULVERTS			
Concrete.....	3,953	309,747	305,794
Metal.....	4,070	154,009	149,939
Terra cotta.....	2,135	84,836	82,701
Wood.....	5,517	119,215	113,698
Total.....	14,675	567,807	552,132
PIPE			
Concrete.....	<i>Linear feet</i> 1,173,097	<i>Linear feet</i> 1,110,235	<i>Linear feet</i> 62,862
Metal.....	497,109	448,313	48,796
Terra cotta (tile).....	1,890,291	1,822,703	67,588
Wood.....	709,842	709,842	0
Total.....	4,270,249	4,091,096	179,153

TABLE 4.—Summary of construction results to June 30, 1930—Continued

Item	To June 30, 1930	To June 30, 1929	Increase
Number	Length	Number	Length
FLUMES			
Concrete.....	172	126	46
Metal.....	2,177	1,974	203
Wood.....	2,911	2,711	200
Total.....	5,260	4,811	449
CANALS LINED			
Length (miles).....	489.0	485.4	3.6
Total.....	489.1	489.5	3.6
BUILDINGS			
Offices.....	<i>Number</i> 107	<i>Number</i> 101	<i>Number</i> 6
Residences.....	747	731	16
Power plants.....	37	35	2
Pumping stations.....	266	238	28
Barns, storehouses, etc.....	579	575	4
Total.....	1,766	1,680	86
Number	Depth	Number	Depth
WELLS			
Number and depth (feet).....	747	692	55
	<i>Feet</i> 85,067	<i>Feet</i> 73,415	<i>Feet</i> 11,652
COMMUNICATIONS			
Roads.....	<i>Miles</i> 1,346.7	<i>Miles</i> 1,208.4	<i>Miles</i> 138.3
Railroads.....	116.2	110.3	5.9
Telephone lines.....	4,010.6	3,350.3	660.3
Transmission lines.....	3,204.7	2,056.0	1,148.7
Total.....	8,678.2	6,725.0	1,953.2
POWER DEVELOPED			
Water and steam.....	<i>Horsepower</i> 180,348	<i>Horsepower</i> 166,128	<i>Horsepower</i> 14,220
EXCAVATION			
Class 1, earth.....	<i>Cubic yards</i> 261,353,745	<i>Cubic yards</i> 248,365,612	<i>Cubic yards</i> 12,988,133
Class 2, indurated material.....	17,186,695	15,961,312	1,225,383
Class 3, rock.....	13,565,599	12,465,576	1,099,923
Total.....	292,105,839	276,822,500	15,283,339
Riprap (cubic yards).....	2,565,250	2,322,787	242,463
Paving (square yards).....	1,968,869	1,980,328	11,459
Concrete (cubic yards).....	4,391,096	4,191,553	200,443
Cement (barrels).....	4,925,932	4,664,450	261,482
Gunite (square yards).....	909,096	888,096	21,000

TABLE 5.—Power plants operated on Bureau of Reclamation projects during fiscal year 1929-30

Project	Name of plant	Outgoing line voltage	Plant capacity (kw-a)	Number of units	Head in feet	First cost of plant	Cost of operation and maintenance	Estimated depreciation	Cost per kilowatt-hour, exclusive of depreciation	Distribution of kilowatt-hours generated				Total output kilowatt-hours	Gross power sales
										Sold to consumers	Irrigation and drainage requirements	Used for other purposes	Losses		
Boise.....	Black Canyon 1.....	66,000	10,000	2	82-92	\$414,317.21	\$13,793.99	\$15,290.99	80.000344	Entire output delivered to Idaho Power Co.				39,922,242	\$63,476.42
Boise River 1.....	Boise River 1.....	22,000	1,875	3	25-30	167,905.37	5,000.00	5,000.00	.....					
Minidoka.....	American Falls (2 plants) 1.....	33,000	10,000	6	47-48	645,921.63	20,188.63	19,470.00	0.000370	Not operated during fiscal year.				54,627,400	157,230.68
Newlands 1.....	Lahontan 2.....	33,000	1,875	3	105-110	141,886.01	5,782.63	4,290.00	.....					
North Platte.....	Guernsey.....	33,000	6,000	4	107	298,364.00	12,497.21	21,000.00	0.000655	2,205,195	238,715	301,040	.....	2,744,950	8,706.68
Okanagan.....	Lingle.....	33,000	1,750	2	70-90	672,244.00	12,972.63	9,300.00	0.001007	23,525,214	46,020	214,954	2,739,462	19,075,340	295,781.40
Rio Grande.....	Power plant No. 2	6,000	187	1	108	11,923.44	Not operated during year.	.....	.....	None.				84,900	None.
.....	Elephant Butte No. 2	2,300	150	1	18-20	8,440.30	2,801.66	.....	.....				
Riverston.....	Pilot Butte.....	33,000	2,000	2	103	219,745.40	16,839.63	12,600.79	0.01002	757,377	.....	84,900	.....	84,900	None.
Salt River.....	Arizona Falls.....	11,000	1,000	2	10	109,500.73	9,716.18	5,475.94	0.00577	.....	.....	198,608	.....	1,680,350	14,488.18
.....	Chandler.....	11,000	600	1	40	91,990.84	9,037.65	4,599.54	0.00510	.....	.....	.....	.....	2,576,678	.....
.....	Crosette.....	11,000	5,250	6	111	745,147.29	42,735.73	37,757.36	0.0486	.....	.....	.....	.....	1,770,434	.....
.....	Roosevelt.....	110,000	19,250	7	70-240	1,255,894.48	60,026.84	61,794.73	0.0283	.....	.....	.....	.....	8,792,500	.....
.....	So. Consolidated.....	40,000	2,000	2	34	163,130.00	14,654.23	8,156.98	0.0077	.....	.....	.....	.....	2,231,000	.....
.....	Mormon Flat.....	110,000	8,750	4	150	482,767.80	12,038.42	24,138.39	0.0031	.....	.....	.....	.....	5,296,000	.....
.....	Horse Mesa.....	110,000	33,300	3	205	754,885.13	49,808.81	37,744.25	0.0094	.....	.....	.....	.....	39,101,000	.....
.....	Stewart Mountain 1.....	45,000	15,000	1	35-114	329,371.98	5,082.39	5,338.91	0.0036	.....	.....	.....	.....	77,300,000	.....
Shoshone.....	Spanish Fork.....	33,000	2,000	2	225	567,698.96	10,301.40	16,914.00	0.0136	6,633,124	None.	242,185	724,001	7,599,320	83,476.81
Strawberry Valley 1.....	.....	11,000	1,000	2	123.5	60,904.80	18,739.70	3,045.00	0.00821	1,912,377	None.	389,339	247,025	2,349,359	38,101.40
Yakima-Sunnyside 1.....	Rocky Ford.....	6,000	187	1	73	23,000.00	2,388.80	1,056.40	0.00361	.....	664,900	.....	.....	664,900	.....
Yuma.....	Siphon Drop.....	33,000	2,000	2	9-29	317,936.00	13,058.82	13,248.00	0.00173	5,485,209	1,881,400	89,665	386,341	7,542,615	58,080.36

1 Operated entire fiscal year.

2 6,000-volt generators. All others 2,300 volts.

3 Operated for stand-by service only.

4 Estimated.

5 Operated by Irrigation District or Water Users' Association.

6 Leased to Canyon Power Company for 10-year period.

7 Includes turbine reconstruction.

8 Includes purchased power.

9 1,000-volt generators.

10 Started operation on Mar. 7, 1930.

11 Includes returned power from Springville.

TABLE 6.—Irrigation and crop results, Government reclamation projects, 1929 1

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage 2	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Arizona: Salt River.....	245,660	245,660	214,750	\$25,423,030	\$118.39	90,280	67,800	67,800	\$6,475,000	\$95.50
Arizona-California:										
Yuma.....	64,430	55,065	54,065	4,369,560	80.82	230	210	190	33,255	232.70
Valley division.....	47,599	43,440	42,450	3,003,800	84.89	.....	.....	.....	.....	.....
Reservation division.....	14,215	11,095	10,905	644,360	59.08	.....	.....	.....	.....	.....
Yuma auxiliary (Mesq.).....	2,885	1,150	710	121,460	171.89	.....	.....	.....	.....	.....
California: Orland.....	20,770	13,480	12,370	503,490	40.70	.....	.....	.....	.....	.....
Colorado:										
Grand Valley.....	30,380	15,190	14,435	634,985	44.00	18,400	13,800	13,400	1,891,000	141.11
Uncompahgre.....	75,655	60,620	60,380	2,212,710	36.65	1,650	1,550	1,545	61,800	40.00
Idaho:										
Boise.....	171,550	164,770	150,180	5,389,320	35.88	139,023	131,500	128,400	5,046,500	39.30
New York irrigation district.....	17,380	15,150	15,000	383,835	25.49	.....	.....	.....	.....	.....
Nampa-Meridian irrigation district.....	40,410	38,710	37,070	1,298,740	34.98	.....	.....	.....	.....	.....
Boise-Kuma irrigation district.....	48,480	47,330	43,330	1,415,665	32.67	.....	.....	.....	.....	.....
Wilder irrigation district.....	56,710	55,945	47,900	2,015,630	42.34	.....	.....	.....	.....	.....
Big Bend irrigation district.....	1,695	1,315	1,315	51,210	39.02	.....	.....	.....	.....	.....
Black Canyon irrigation district.....	6,875	6,300	5,805	226,140	38.93	.....	.....	.....	.....	.....
King Hill.....	8,000	6,060	6,375	209,560	30.15	.....	.....	.....	.....	.....
Minidoka.....	120,170	106,070	90,340	4,417,910	44.47	793,610	689,070	663,750	32,896,800	49.56
Gravely division.....	71,240	60,675	56,720	2,478,610	43.69	.....	.....	.....	.....	.....
Pumping division.....	48,930	45,395	42,610	1,939,300	45.51	.....	.....	.....	.....	.....
Montana:										
Huntley.....	32,540	23,485	23,485	1,037,150	44.12	.....	.....	.....	.....	.....
Milk River.....	134,286	40,290	38,330	975,160	25.44	.....	.....	.....	.....	.....
Malta division.....	56,650	13,650	13,210	622,250	21.36	.....	.....	.....	.....	.....
Glasgow division.....	22,135	4,390	3,800	77,560	20.42	.....	.....	.....	.....	.....
Chinook division.....	55,600	22,220	21,320	615,310	28.86	.....	.....	.....	.....	.....
Sun River.....	55,875	20,860	22,700	438,520	15.41	.....	.....	.....	.....	.....
Fort Shaw division.....	13,090	7,190	7,340	183,250	20.88	.....	.....	.....	.....	.....
Greenfield and Big Coulee division.....	41,875	13,170	20,260	273,670	13.44	.....	.....	.....	.....	.....

1 Data are for calendar year (irrigation season) except on Salt River project, where data are for corresponding "agricultural year," October, 1928, to September, 1929.

2 Areas for which bureau was prepared to supply water in 1929.

3 Includes 24,950 acres reported as vacant, 2,414 acres of "home tracts," and 3,948 acres (town site acreage) on which no crop was reported.

4 Includes dry farmed tracts irrespective of the figures given below under "cropped without irrigation."

TABLE 6.—Irrigation and crop results, Government reclamation projects, 1929—Continued

State and project	Lands on projects covered by crop census					Other lands served by Government works, usually by a partial water supply through private canals under Warren Act or other water-service contracts				
	Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value		Irrigable acreage	Irrigated acreage	Cropped acreage	Crop value	
				Total	Per acre				Total	Per acre
Montana-North Dakota:										
Lower Yellowstone.....										
District No. 1.....	47,450	23,945	23,945	\$779,960	\$32.58					
District No. 2.....		17,855	17,855	573,360	32.13					
Nebraska-Wyoming:										
North Platte.....	238,470	188,450	188,450	7,289,140	38.73	127,590	103,440	102,220	\$4,831,900	\$47.22
Pathfinder irrigation district.....	111,625	87,493	87,493	3,332,370	38.83					
Gering and Fort Laramie irrigation district.....	55,075	49,240	49,240	2,364,940	48.02					
Greeley irrigation district.....	58,305	39,830	39,830	1,432,110	35.96					
Northport irrigation district.....	16,175	11,385	11,385	240,720	21.93					
Nevada: Newlands.....	87,500	54,040	51,380	2,057,260	40.07					
New Mexico: Carlisbad.....	25,055	24,535	24,220	1,847,000	76.27					
New Mexico-Texas: Rio Grande.....	155,000	144,200	139,775	10,664,670	78.39	71,000	60,000	49,060	1,878,430	37.80
Oregon:										
Umatilla.....	18,730	11,340	11,020	286,400	26.00	605	540	435	20,825	50.00
East division.....	11,730	7,680	7,440	177,890	23.88					
West division.....	6,000	3,660	3,580	108,510	30.41	605	540	435	20,825	50.00
Oregon-California:										
Klamath.....	55,390	45,870	43,765	1,790,670	40.91	63,620	34,700	34,540	1,069,840	30.70
Main division.....	41,330	34,730	33,975	1,447,160	42.60					
Tule Lake division.....	13,800	11,120	9,790	343,510	35.10					
South Dakota: Belle Fourche.....	40,620	36,195	47,955	1,206,575	25.16					
Utah: Strawberry Valley.....	41,030	40,000	38,495	1,305,440	34.00	7,275	7,230	7,230	207,110	29.43
Washington:										
Okanogan.....	5,850	4,255	3,835	979,220	253.35					
Yakima.....	133,260	114,665	101,675	12,431,520	122.27	166,720	124,390	124,390	18,315,030	147.00
Sunnyside division.....	102,480	87,565	79,975	7,947,570	100.51					
Tieton division.....	30,800	27,100	22,600	4,484,350	198.42					
Wyoming:										
Shoshone.....	73,640	43,390	43,270	1,270,970	29.37					
Gasland division.....	41,650	33,130	33,130	1,062,330	32.97					
Frankie division.....	29,960	8,670	8,659	160,340	19.96					
Willwood division.....	11,830	2,190	2,110	18,300	8.68					
Riverton.....	29,060	1,075	875	10,120	11.56					
Total with irrigation.....	1,922,330	1,483,900	1,429,070	87,539,670	61.66	1,480,040	1,234,230	1,192,990	72,720,490	60.96

CROPPED WITHOUT IRRIGATION

Milk River.....			14,140	72,180	5.11					
Sun River.....			6,310	59,120	9.36					
Fort Shaw division.....			145	1,340	9.24					
Greenfields and Big Coulee division.....			6,165	57,780	9.36					
Lower Yellowstone.....			11,970	109,980	9.18					
District No. 1.....			5,540	62,300	11.24					
District No. 2.....			59,760	658,440	11.00					
Klamath.....										
Total cropped without irrigation.....			92,180	899,720	9.13					
Grand totals.....	1,922,330	1,483,900	1,512,250	88,439,390	58.49	1,480,040	1,234,230	1,192,990	72,720,490	60.96
Grand totals of projects proper and Warren Act.....	3,402,370	2,718,130	2,705,240	161,179,880	60.00					

¹ Includes dry farmed tracts irrespective of the figures given below under "cropped without irrigation."

² This figure represents irrigable area of classes 1 to 4 inclusive (productive land); area to which the bureau was prepared to supply water, including class 5 land, was 58,248 acres.

³ This figure represents assessed area. The irrigable area, including class 5 land, was 74,500.

TABLE 7.—Irrigated and cropped acreage and crop values by years, 1906-1929

	Federal irrigation projects				Warren Act land				Entire area			
	Irrigated acreage	Cropped acreage	Crop value		Irrigated acreage	Cropped acreage	Crop value		Cropped acreage	Irrigated acreage	Crop value	
			For year	Cumulative total			For year	Cumulative total			For year	Cumulative total
1906	22,300	1,201,100	\$244,400	\$5,005,300					170,100	22,300	\$244,400	\$5,005,300
1907	26,000	1,100,000	4,700,000	9,705,300					1,100,000	187,400	4,700,000	9,705,300
1908	30,000	1,300,000	11,020,700	20,726,000					1,200,000	410,000	11,020,700	20,726,000
1909	410,000	470,100	12,708,000	33,434,000					1,200,000	410,000	11,020,700	20,726,000
1910	541,000	640,000	13,825,000	47,259,000					1,200,000	410,000	11,020,700	20,726,000
1911	588,000	705,000	18,475,000	65,734,000					1,200,000	410,000	11,020,700	20,726,000
1912	608,000	705,000	18,475,000	84,209,000					1,200,000	410,000	11,020,700	20,726,000
1913	701,000	705,000	18,475,000	102,684,000					1,200,000	410,000	11,020,700	20,726,000
1914	701,000	705,000	18,475,000	121,159,000					1,200,000	410,000	11,020,700	20,726,000
1915	1,007,000	828,000	32,810,000	153,969,000					1,200,000	410,000	11,020,700	20,726,000
1916	1,007,000	828,000	32,810,000	186,779,000					1,200,000	410,000	11,020,700	20,726,000
1917	1,187,000	1,113,000	88,074,100	274,853,000					1,200,000	410,000	11,020,700	20,726,000
1918	1,187,000	1,113,000	88,074,100	362,927,000					1,200,000	410,000	11,020,700	20,726,000
1919	1,202,000	1,157,000	40,020,000	402,947,000					1,200,000	410,000	11,020,700	20,726,000
1920	1,202,000	1,157,000	40,020,000	442,967,000					1,200,000	410,000	11,020,700	20,726,000
1921	1,202,000	1,157,000	40,020,000	482,987,000					1,200,000	410,000	11,020,700	20,726,000
1922	1,202,000	1,157,000	40,020,000	522,987,000					1,200,000	410,000	11,020,700	20,726,000
1923	1,202,000	1,157,000	40,020,000	562,987,000					1,200,000	410,000	11,020,700	20,726,000
1924	1,202,000	1,157,000	40,020,000	602,987,000					1,200,000	410,000	11,020,700	20,726,000
1925	1,202,000	1,157,000	40,020,000	642,987,000					1,200,000	410,000	11,020,700	20,726,000
1926	1,202,000	1,157,000	40,020,000	682,987,000					1,200,000	410,000	11,020,700	20,726,000
1927	1,202,000	1,157,000	40,020,000	722,987,000					1,200,000	410,000	11,020,700	20,726,000
1928	1,202,000	1,157,000	40,020,000	762,987,000					1,200,000	410,000	11,020,700	20,726,000
1929	1,202,000	1,157,000	40,020,000	802,987,000					1,200,000	410,000	11,020,700	20,726,000

* Estimated.

TABLE 8.—Summary of livestock and equipment on Federal irrigation projects, 1929

	Number	Value	
		Each	Total
Horses.....	71,080	\$52.02	\$3,697,707
Mules.....	10,274	87.85	902,096
Beef cattle.....	67,909	52.31	3,548,450
Purebred sires.....	392	147.95	57,907
Scrub sires.....	133	74.10	9,855
Dairy cattle.....	129,336	79.56	10,290,656
Purebred sires.....	1,635	128.71	210,453
Scrub sires.....	1,086	54.29	58,658
Sheep.....	433,895	8.90	3,861,411
Hogs.....	93,095	9.60	894,564
Brood sows.....	11,900	19.65	234,399
Babbits.....	2,150	1.65	3,550
Fowls.....	2,075,831	1.16	2,418,384
Bees (hives).....	37,403	6.19	231,509
Total stock value.....			26,420,689
Value of equipment.....			16,246,570
Total stock and equipment.....			42,667,259
Increase or decrease in value over 1928:			
Stock.....			-1,377,076
Equipment.....			3,368,971
Total increase.....			1,991,895

* Value of equipment on Salt River project estimated.

TABLE 9.—Settlement and economic data, 1929-30

State and project	Irrigated farms		Towns		Number of schools	Number of churches	Banks				
	Number	Population	Number	Population			Number	Capital stock	Deposits	Number of depositors	
Arizona: Salt River.....	7,500	46,045	12	84,767	86	70	13	\$2,320,000	\$35,354,000	50,000	
Arizona-California: Yuma.....	1,717	3,556	5	11,230	13	25	3	215,000	2,720,500	7,312	
California: Orland.....	691	1,680	1	1,700	10	9	2	100,000	1,140,500	3,628	
Colorado: Grand Valley.....	486	1,184	6	15,815	24	35	4	365,000	4,500,000	9,500	
Uncompaghe.....	1,708	5,713	3	7,400	27	27	5	445,000	3,387,200	11,230	
Idaho: Boise.....	4,195	15,400	16	52,600	55	80	15	2,195,000	28,200,000	36,000	
King Hill.....	185	546	3	1,550	5	5	1	20,000	300,000	900	
Minidoka.....	2,189	7,042	6	8,950	23	50	5	200,000	2,450,100	4,462	
Montana: Huntley.....	592	1,939	5	700	8	8	1	25,000	290,000	500	
Milk River.....	407	1,378	17	7,635	32	33	10	410,000	5,101,800	8,863	
Sun River.....	406	926	6	408	10	10	3	70,000	253,300	1,034	
Montana-North Dakota: Lower Yellowstone.....	518	1,561	8	3,100	17	19	4	126,000	680,000	3,525	
Nebraska-Wyoming: North Platte.....	2,847	9,967	18	22,687	62	61	14	40,500	6,047,600	14,544	
Nevada: Newlands.....	430	2,466	4	5,900	13	9	1	75,000	1,158,500	1,900	
New Mexico: Carlsbad.....	698	2,554	4	1,979	13	11	1	80,000	950,000	1,800	
New Mexico-Texas: Rio Grande.....	4,802	24,980	36	148,552	84	122	9	2,300,000	30,500,200	39,500	
Oregon: Umatilla.....	293	761	2	1,055	4	4	1	25,000	255,000	1,180	
East division.....	106	450	3	450	3	5	2	65,000	333,000	785	
West division.....	32	60	2	1,200	2	2	2	530,500	6,897,000	16,000	
Oregon-California: Klamath.....	650	2,855	5	16,025	35	15	6	100,000	2,900,000	5,000	
South Dakota: Belle Fourche.....	126	2,271	5	2,493	28	14	4	275,000	1,715,000	3,600	
Utah: Strawberry Valley.....	2,200	5,550	12	25,000	27	25	4	3	125,000	1,299,200	2,500
Washington: Okanogan.....	382	1,026	3	4,356	6	8	3	210,000	2,689,800	8,378	
Yakima.....	1,390	3,921	8	8,315	42	31	8	18,500	125,000	500	
Sunnyside.....	355	1,100	5	8,217	22	16	6	375,000	4,843,400	9,460	
Tieton.....	61	4	4	2,900	3	8	1	50,000	485,000	1,020	
Kittitas.....	846	1,901	5	1,500	5	9	3	73,000	619,000	2,124	
Wyoming: Riverton.....	19	61	4	2,900	3	8	1	50,000	485,000	1,020	
Shoshone.....	846	1,901	5	1,500	5	9	3	73,000	619,000	2,124	
Total.....	39,970	157,088	214	473,073	686	713	130	11,180,000	145,386,400	245,181	

GEOLOGICAL SURVEY PUBLIC LAND STATISTICS

TABLE 1A.—Status of surface lands in 11 public-land States (acres)

	Arizona	California	Colorado	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming	Total
WITHDRAWALS												
(1) Reclamation Bureau.....	4,327,245	2,219,980	465,480	2,888,400	549,400	2,106,940	303,640	1,294,750	1,357,360	1,346,020	1,740,835	18,000,030
(2) National forests.....	11,466,626	19,026,819	13,369,549	19,300,773	16,170,658	4,978,198	8,491,881	13,297,938	7,475,762	9,328,372	8,461,755	131,577,281
(3) National Park Service:												
National parks.....	645,809	1,213,765	293,012	23,040	1,138,481	-----	-----	139,360	91,280	297,782	2,108,800	5,881,329
National monuments.....	31,125	3,407	13,885	49,565	160	-----	23,566	-----	-----	-----	1,363	130,758
(4) Geological Survey:												
Power purposes.....	1,198,875	1,416,160	462,841	412,996	210,962	357,468	261,737	660,663	651,321	363,801	197,728	6,194,552
Reservoir site reserves.....	23,040	45,294	1,728	-----	9,080	20,425	1,440	3,367	11,673	80	31,797	131,306
1888 reservoirs.....	-----	6,547	17,945	-----	20,425	1,440	3,367	-----	11,673	-----	-----	61,267
Public water.....	19,745	190,251	9,705	15,257	8,857	14,061	10,461	26,221	36,255	620	88,865	424,238
(5) Indian reservations.....	20,463,620	298,171	478,154	677,206	6,929,430	847,499	3,888,821	1,742,938	452,627	1,991,818	2,243,822	39,910,422
(6) General Land Office:												
Stock driveways.....	497,042	33,682	210,200	767,861	224,828	3,535,191	1,105,061	428,341	1,224,222	10,919	1,207,263	9,264,670
Carey Act segregation.....	13,745	-----	32,096	154,708	20,212	-----	-----	107,096	37,034	-----	498,560	732,866
Carey Act withdrawals.....	21,120	44,140	-----	25,680	81,691	248	74,300	180,112	38,790	1,629	46,476	517,136
(7) Game and bird reserves.....	-----	68,249	78,127	-----	-----	-----	-----	-----	91,472	-----	9,481	247,529
(8) Naval oil and oil shale.....	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

(1) From Bureau of Reclamation table dated Mar. 14, 1930, includes all land in developed projects which has been patented.

(2) From National forest circular dated June 30, 1929, patented lands not included.

(3) From National Park Service compilation dated August, 1929, no patented lands included.

(4) From Geological Survey monthly summary for March, 1930, except for 1888 reservoirs which are special compilation of such withdrawals exclusive of patented land and land otherwise withdrawn. These reservoirs were created under the act of Oct. 2, 1888 (25 Stat. 405, 526), repealed except as to existing withdrawals by act of Aug. 30, 1890 (26 Stat. 371, 391). Power purposes include withdrawals, classifications, designations, and Federal power act withdrawals not otherwise withdrawn for power purposes. (Patented lands and duplications in withdrawn acreages not counted.)

(5) From Indian Office pamphlet published Oct. 15, 1929, includes allotted and unallotted lands in all Indian reservations.

(6) and (7) From General Land Office report for year ending June 30, 1929.

(8) From Indian Office pamphlet published Oct. 15, 1929, (Withdraws the land from all forms of entries.)

TABLE 1A.—Status of surface lands in 11 public-land States (acres)—Continued

	Arizona	California	Colorado	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming	Total
WITHDRAWALS—continued												
(9) Miscellaneous.....	a 684 b 2,590 c 108,127 d 10,651 e 440 f 15,080	a 1,219 b 604,242 c 336,924 g 2,080 h 451	a 302 b 16,403 c 573,178 d 28,427 e 320	e 2,448 b 51,840 c 80,628 d 28,427 e 320	a 6,326 b 1,134 c 206,270 d 28,427 e 320 k 12,776 l 80	a 534 b 85,760 c 35,480 d 80 e 55,100 f 100 g 100	a 503 b 72,624 c 1,344,201 d 192,872 e 55,100 f 100 g 100	a 839 b 72,624 c 1,344,201 d 192,872 e 55,100 f 100 g 100	a 360 b 3,401 c 44,901 d 10 e 40 f 100 g 100 h 1,516 i 285,718	a 170 b 82 c 627 d 10 e 40 f 100 g 100 h 1,516 i 285,718	a 1,274 b 851,755 c 5,760 d 10 e 40 f 100 g 100 h 1,516 i 285,718	5,262,882
(10) Total.....	38,840,934	25,837,951	15,962,725	24,558,828	25,233,688	12,139,811	14,409,776	19,333,726	11,524,968	13,533,967	17,730,186	219,125,960
(11) State area.....	72,838,000	96,017,000	66,401,000	53,524,000	93,397,000	70,526,000	78,396,000	61,192,000	52,596,000	44,241,000	60,542,000	753,067,000
(12) Open public lands.....	16,911,367	20,295,421	8,218,875	10,734,420	6,900,144	53,410,908	16,282,582	13,227,141	25,147,897	951,903	17,035,537	189,030,185
(13) Unreserved area.....	33,957,066	73,779,069	50,438,725	28,765,172	68,163,312	58,380,189	63,864,224	41,838,274	41,674,622	30,687,013	42,811,814	535,941,040
(14) Ratio of open public to unreserved land (per cent).....	50	27	16	37	10	92	25	32	61	3	40	35

(9) From General Land Office table for period ending Nov. 30, 1929. Includes miscellaneous withdrawals under act of June 25, 1910 (36 Stat. 847), as amended.

a. Administrative site.

b. Aid of legislation.

c. Classifications.

d. Agricultural experiment stations.

e. Military purposes.

f. Public parks.

g. Aeroplane purposes.

h. Town-site purpose, harbor development, and lighthouse.

(12) From General Land Office report for year ending June 30, 1929. Includes all vacant, unreserved, unappropriated, public lands of the United States.

(13) Area of State (item 11) less reserved land (item 10) to show acreage in which existing public land laws have been operative.

TABLE 1B.—Statistics of subsurface classifications in public-land States (acres)

	Arizona	California	Colorado	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Washington	Wyoming	Total
(1) Producing oil and gas structures.....		185,875	20,741		98,587		23,133		27,650		158,571	514,557
(2) Coal.....												
Withdrawn.....	139,415	17,403	4,142,233	4,761	7,853,941	83,673	5,084,069	4,361	3,636,541	691,801	2,260,694	23,929,002
Classified.....		8,739	3,082,272	4,063	8,563,862		570,372	18,887	1,267,607	141,444	6,740,594	20,398,451
(3) Oil.....												
Withdrawn.....	336	1,178,392	217,116		1,350,426				1,341,264		541,777	4,629,331
Classified.....					67,651							67,651
(4) Oil shale.....												
Withdrawn.....			64,560			123			91,404			156,147
Classified.....			952,239						2,703,755			4,116,067
(5) Phosphate.....												
Withdrawn.....				391,532	279,944				277,344		989,149	1,937,969
Classified.....				208,299	3,833				2,507		25,260	300,362
(6) Potash, withdrawn.....		90,357				30,422	6,282,160					9,411,939
(7) Helium.....									12,255			12,255
(8) Total.....	139,771	1,480,947	8,479,161	669,195	18,228,244	123,218	14,959,734	23,248	9,360,967	833,245	11,176,061	65,473,761

(1-7) From Geological Survey monthly summary for March, 1930 (withdrawals in this list made without reference to status of lands as to private ownership or other withdrawals).

TABLE 2.—Summary of classification of forage types

Classification (includes only counties of more than 30 per open public land)	Arizona	California	Colorado	Idaho	Montana	Nevada	New Mexico	Oregon	Utah	Wyoming	Total
Brought land into Federal ownership	806,000	1,078,120	1,029,000	1,727,460	1,124,000	535,000	182,800	790,265	1,001,520	782,000	9,228,455
Dry-land farm land		291,480	985,000	440,000	7,834,000			291,300	690,140	2,028,000	12,685,720
Grass											
Crested											
Shrubland				420,100							
Timber				2,345,000							
Woodland				2,118,650							
Shrubland				1,154,000							
Timber				1,178,650							
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Woodland				1,178,650	</						

Montana not subdivided into grazing types; mainly sagebrush and grassland.

Open public land only.

DISPOSAL OF MINERALS UNDER THE MINING LAWS AND UNDER THE MINERAL LEASING LAWS

[Prepared by the Geological Survey]

Minerals other than those subject to disposal under the several mineral leasing laws may be located and patents obtained therefor pursuant to the legislative authority in title 32, chapter 6, of the United States Revised Statutes, providing in part:

* * * valuable mineral deposits in lands belonging to the United States
* * * are hereby declared to be free and open to exploration and purchase,
and the lands in which they are found to occupation and purchase, by citizens
of the United States and those who have declared their intention to become such
* * *. (Sec. 2319, R. S.)

The location of a mining claim involves the acts of discovery, posting a notice of claim, staking its boundaries, and recording the notice of location in the county recorder's office. When the locator desires the patent (title) for his claim he must file an application for patent in the district land office, and this is ordinarily the first notice the Federal Government has that such a claim has been located. This application is not necessary so far as his rights to the possession and use of the land for mining of the minerals are involved. According to the courts, a locator's possessory rights are property in the fullest sense of the word. A claim may be sold, transferred, mortgaged, and inherited, and is subject to taxation. A claim may be lost by abandonment or by forfeiture or may for legal cause be declared null and void by proceedings of the Interior Department. The title to the lands embraced in mining claims located on the public domain remains in the United States until patent. The locator's interest is a possessory right, though it may be indefinitely continued by compliance with the mining law. (Miller v. Oil Co., 23 Fed. (2d) 317.)

Mineral locations under the above-mentioned chapter are divided into two classes—lodes and placers. Lode locations are limited to an area not exceeding 1,500 feet along the course of the vein and not exceeding 300 feet on each side thereof. Placer locations are limited to an area not exceeding 20 acres by one person or corporation and not exceeding an area of 160 acres when made by an association of not less than eight locators. In Alaska the maximum area is 40 acres.

The law (sec. 2324, R. S.) requires assessment work of a value of not less than \$100 in labor or improvements to be made annually on each unpatented location, and when application for patent is filed it must be shown that an expenditure of not less than \$500 for labor or improvements has been made on each claim.

The purchase price of lode claims is \$5 per acre, and the purchase price of placer claims is \$2.50 per acre.

There is no limit on the number of lode or placer locations that one person may make and obtain patent therefor, but discovery and

the requisite expenditures must be made on each location. In Alaska placer locations are restricted to not exceeding two by the same person in any one calendar month.

Certain minerals, as follows, are subject to disposal under the mineral leasing laws, noted:

Act of February 25, 1920 (41 Stat. 437):

COAL

PROSPECTING PERMITS

Purpose: To establish the existence or workability of coal deposits and thereafter promote the mining of coal.

Area: 2,560 acres maximum.

Royalty: 25 cents per ton for coal mined under permit.

Rental: None.

Term: Two years with authority to extend.

LEASES

Purpose: To promote the mining of coal.

Area: 2,560 acres maximum.

Royalty: 5 cents per ton minimum.

Rental: 25 cents to \$1 per acre minimum annually.

Term: Indeterminate, subject to renewal at end of 20 years at terms and conditions made by the Secretary of the Interior.

LIMITED LICENSES

Purpose: To mine coal not for sale and without profit.

Area: 40 acres or less for an individual; 2,560 acres maximum for a municipal corporation according to population.

Royalty: None.

Rental: None.

Term: Two years.

PHOSPHATE

LEASES

Purpose: To promote the mining of phosphate.

Area: 2,560 acres maximum.

Royalty: 2 per cent of the gross value of the output at the mine.

Rental: 25 cents to \$1 per acre minimum annually.

Term: Indeterminate, subject to renewal at end of 20 years at terms and conditions made by the Secretary of the Interior.

OIL AND GAS

PROSPECTING PERMITS

Purpose: To establish the existence of valuable deposits of oil or gas and thereafter promote the mining of such minerals.

Area: 2,560 acres maximum.

Royalty: 20 per cent of gross value of oil or gas mined under permit.

Rental: None.

Term: Two years with authority to extend.

LEASES

Purpose: To promote the mining of oil and gas.

Area: 2,560 acres maximum.

Royalty: 5 per cent for leases for a quarter of the area in prospecting permit, 12½ per cent minimum for other leases based on prospecting permits and other leases.

Rental: \$1 per acre per annum.

Term: 20 years, with preferential right in lessees to renew for successive periods of 10 years upon reasonable terms and conditions prescribed by the Secretary of the Interior.

OIL SHALE

LEASES

Purpose: To promote the mining of oil shale.

Area: 5,120 acres maximum.

Royalty: Such as are specified in the lease.

Rental: 50 cents per acre per annum.

Term: Indeterminate.

SODIUM

(The act of February 25, 1920, as amended by the act of December 11, 1928, 45 Stat. 1019)

PROSPECTING PERMITS

Purpose: To establish the existence of valuable deposits of chlorides, sulphates, carbonates, borates, silicates, or nitrates of sodium.

Area: 2,560 acres maximum.

Royalty: 12½ per cent of the sale value at point of shipment of all material sold.

Rental: None.

Term: Two years.

LEASES

Purpose: To promote the mining of sodium.

Area: 2,560 acres maximum.

Royalty: Not less than 2 per cent of the quantity of gross value of the output at the point of shipment to market.

Rental: 25 cents to \$1 per acre annually.

Term: 20 years with preferential right in lessee to renew for successive periods of 10 years upon reasonable terms and conditions as may be prescribed by the Secretary of the Interior.

The act approved October 2, 1917 (40 Stat. 297), authorized the issuance of potash prospecting permits for a maximum of 2,560 acres for exploratory work for two years on lands, excepting certain lands in California, and provided that upon the discovery of potash the permittees shall be entitled to patents for not exceeding one-fourth of the land in the permits, the remainder to be leased for indeterminate periods subject to adjustment at the end of each 20-year period in areas not exceeding 2,560 acres, at royalties to be specified in the lease of not less than 2 per cent on the gross value of the output at the point of shipment, and at rentals of 25 cents to \$1 per acre per year. The

same act provided that the excepted lands in California may be operated by the United States or leased subject to the terms and provisions of the act.

This act was repealed by sec. 6 of the act of February 7, 1927 (44 Stat. 1057), except as to applications filed prior to January 1, 1926, or valid claims existent at date of passage of the act of February 7, 1927, which act extended the general provisions of certain sections of the act of February 25, 1920, to include deposits of potash.

Act of February 7, 1927 (44 Stat. 1057):

POTASH

PROSPECTING PERMITS

Purpose: To establish the existence of valuable deposits of chlorides, sulphates, carbonates, borates, silicates, or nitrates of potassium.

Area: 2,560 acres maximum.

Royalty: None

Rental: None.

Term: Two years.

LEASES

Purpose: To promote the mining of potash.

Area: 2,560 acres maximum.

Royalty: Not less than 2 per cent of the quantity or gross value of the output at the point of shipment to market.

Rental: 25 cents to \$1 per acre per annum.

Term: 20 years with preferential right in lessee to renew for successive periods of 10 years upon reasonable terms and conditions as may be prescribed by the Secretary of the Interior.

Act of April 17, 1926 (44 Stat. 301):

SULPHUR

PROSPECTING PERMITS

Purpose: To establish the existence of valuable deposits of sulphur in Louisiana.
Area: 640 acres maximum.

Royalty: None.

Rental: None.

Term: Two years.

LEASES

Purpose: To promote the production of sulphur in Louisiana.

Area: 640 acres maximum.

Royalty: 5 per cent for leases based on prospecting permits and at such royalty as may be fixed in other leases issued.

Rental: 50 cents per acre per annum.

Term: Subject to act of Feburary 25, 1920.

NOTE.—In Alaska coal is disposed of under the act of October 20, 1914 (38 Stat. 741), and the act of March 4, 1921 (41 Stat. 1363), and the other leasing laws mentioned above, except sulphur, are applicable to Alaska with certain special provisions.

TABLE 1.—National parks administered by the National Park Service, Department of the Interior

[illegible]

General information circulars on these parks may be obtained free on application.

Boundary changed.

³ Date acquisition private land as provided by act of June 7, 1924.

TABLE 1.—National parks administered by the National Park Service, Department of the Interior—Continued

[Number, 23; total area, 12,431.63 square miles, or 7,956,038.67 acres]

Name	Location	Nearest rail stations	When established	Statute reference	Area, square miles	Area, acres	Private lands, acres	Special characteristics
Grand Canyon ¹ 1919	North central Arizona.	Grand Canyon Santa Fe system, North Rim motor station from Cedar City, Utah, Union Pacific, or from Marysville, Utah, Denver & Rio Grande Western, Idaho, Oregon Short Line.	Feb. 26, 1919 Feb. 25, 1927 Mar. 7, 1928 ²	40 Stat. 1175..... 44 Stat. 1238. 45 Stat. 200-234.	1,000.00	645,808.79	2,452.16	The greatest example of erosion and the most sublime spectacle in the world
Grand Teton ¹ 1929	North western Wyoming.	Victor, Idaho, Oregon Short Line.	Feb. 26, 1929	45 Stat. 1314.....	150.00	96,000.00	1,122.04	Includes most spectacular portion of Teton Mountains, an uplift of unusual grandeur.
Great Smoky Mountains (proposed). 1930	North Carolina and Tennessee.	Maryville, Knoxville & Augusta R. R. (Tenn.), Bryson, Southern R. R. (N. C.).	Aug. 28, 1930	.....	248.22	158,876.50	.....	This area is not to be developed as a national park until at least 427,000 acres have been donated to the United States, as specified in the organic act. Meanwhile the park area of 158,876.50 acres already in Federal ownership is being protected by the National Park Service.
Hawaii ¹ 1916	Hawaii.....	Interisland steamers from Honolulu.	Aug. 1, 1916 May 1, 1923 ² Feb. 12, 1927 ² Apr. 11, 1928 ²	39 Stat. 432..... 42 Stat. 393. 45 Stat. 424. 44 Stat. 1087.	245.00	156,800.00	22.00	Interesting volcanic area—Kilauea and Mauna Loa, active volcanoes on the island of Hawaii; Haleakala, a huge extinct volcano on the island of Maui.
Hot Springs ¹ 1921	Middle Arkansas.	Hot Springs, Rock Island & Missouri Pacific systems.	Mar. 4, 1921 ²	41 Stat. 1407.....	1.50	927.00	.....	40 hot springs said to possess healing properties; many hotels and boarding houses; 19 bathhouses under Government supervision. Reserved by Congress in 1832 as the Hot Springs Reservation to prevent exploitation of hot waters.
Lassen Volcanic ¹ 1916	Northern California.	Red Bluff, Southern Pacific; Patton, Western Pacific; Susanville, Southern Pacific.	Aug. 9, 1916 Apr. 26, 1928 ² May 21, 1928 ² Jan. 10, 1929 ² Apr. 10, 1930 ² July 3, 1930 ²	39 Stat. 442..... 43 Stat. 466. 45 Stat. 644. 45 Stat. 1081. Public 148, 71st Cong. Public 507, 71st Cong.	163.30	104,526.61	3,298.40	Only active volcano in United States proper; Lassen Peak 10,433 feet; cinder cone, 6,913 feet; hot springs, mud geysers.
Mesa Verde ¹ 1906	Southwestern Colorado.	Manitou, Denver, and Rio Grande Western.	June 29, 1906 June 30, 1913 ²	34 Stat. 616..... 38 Stat. 82, 83, 84.	80.11	51,273.42	790.00	Most notable and best-preserved prehistoric cliff dwellings in United States if not in the world.
Mount McKinley ¹ 1917	South central Alaska.	McKinley Park Station, United States Alaska Railroad.	Feb. 26, 1917 Jan. 30, 1922 ²	39 Stat. 938..... 42 Stat. 359.	2,645.00	1,692,800.00	.....	Highest mountain in North America; rises higher above surrounding country than any other mountain in the world.
Mount Rainier ¹ 1899	West central Washington.	Ashford, Chicago, Milwaukee, St. Paul and Pacific.	Mar. 2, 1899 May 28, 1925 ²	30 Stat. 993..... 41 Stat. 668.	325.00	207,782.00	485.59	Largest accessible single peak glacier system; 28 glaciers, some of large size; 48 square miles of glacier; 50 to 500 feet thick; wonderful subalpine wild-flower fields. Sulphur and other springs said to possess healing properties.
Platt ¹ 1902	Southern Oklahoma.	Sulphur, Santa Fe system and Frisco lines.	July 1, 1902 Apr. 21, 1901 ² June 29, 1905 ² Jan. 29, 1915 ² Feb. 11, 1917 ² June 2, 1924 ² June 9, 1925 ² June 21, 1930 ²	32 Stat. 611, 655..... 33 Stat. 220. 34 Stat. 837. 38 Stat. 798. 39 Stat. 916. 43 Stat. 212. 44 Stat. 712. Public 494, 71st Cong.	1.30	848.31	.....	Heart of the Rockies; snowy range, peaks 11,060 to 14,255 feet altitude; remarkable records of glacial period.
Rocky Mountain ¹ 1915	North middle Colorado.	Longmont, Burlington Route and Colorado & Southern; Loveland, Colorado & Southern; Lyons, Burlington Route; Boulder, Denver Interurban and Colorado & Southern; Fort Collins, Union Pacific and Colorado & Southern; Granby, Denver & Salt Lake.	Sept. 25, 1900 Oct. 1, 1890 July 3, 1926 ²	26 Stat. 478..... 26 Stat. 650. 44 Stat. (pt. 2) 818.	604.00	386,560.00	1,971.22	The Big Tree National Park; scores of sequoias 20 to 30 feet in diameter, thousands over 10 feet in diameter; General Sherman Tree, 37.5 feet in diameter and 273.9 feet high; towering mountain ranges; startling geologies; Mount Whitney and Kern River country.
Sequoia ¹ 1890	Middle eastern California.	Exeter or Visalia, Santa Fe and Southern Pacific.	Sept. 25, 1890 Oct. 1, 1890 July 3, 1926 ²	26 Stat. 478..... 26 Stat. 650. 44 Stat. (pt. 2) 818.	604.00	386,560.00	1,971.22	Small park with woods, streams, and a lake; is a wild-animal preserve.
Sullys Hill ¹ 1904	North Dakota.....	Devils Lake, Great Northern, and Soo Line.	Apr. 27, 1904	33 Stat. 322, 323, 2618.	1.20	780.00	.....	Caverns having several miles of galleries and numerous chambers containing peculiar formations.
Wind Cave ¹ 1903	South Dakota.....	Hot Springs, Burlington Route and Chicago & North Western.	Jan. 9, 1903	32 Stat. 765.....	17.00	10,869.00	.....

¹ General information circulars on these parks may be obtained free on application.² Boundary changed³ Established as a reservation Apr. 20, 1832.

TABLE 1.—National parks administered by the National Park Service, Department of the Interior—Continued

[Number, 23; total area, 12,431.63 square miles, or 7,956,038.67 acres]

Name	Location	Nearest rail stations	When established	Statute reference	Area, square miles	Area, acres	Private lands, acres	Special characteristics
Yellowstone ¹ 1872	Northwestern Wyoming, southwestern Montana, and northern Idaho.	Gardiner, Mont., Northern Pacific; West Yellowstone, Mont., Union Pacific; Cody, Wyo., Burlington Route; Lander, Wyo., Chicago & North Western; Three Forks, Mont., Chicago, Milwaukee, St. Paul and Pacific.	Mar. 1, 1872 Mar. 1, 1929 ²	17 Stat. 32, 33 45 Stat. 1435.	3,426.00	2,192,640.00	7,188.00	More geysers than in all rest of world together; boiling springs; mud volcanoes; petrified forests; Grand Canyon of the Yellowstone, remarkable for gorgeous coloring; large lakes; many large streams and waterfalls; vast wilderness, one of the greatest wild-bird and animal preserves in the world; exceptional trout fishing.
Yosemite ¹ 1890	Middle eastern California.	Merced, Southern Pacific and Santa Fe; thence Yosemite Valley Railroad to El Portal.	Oct. 1, 1890 Feb. 7, 1903 June 11, 1906 May 28, 1928 ² Mar. 2, 1929 ² May 9, 1930 ²	26 Stat. 650. 33 Stat. 702. 34 Stat. 831. 45 Stat. 787. 45 Stat. 1496. Public 187,718 ² Cong.	1,138.78	728,823.59	5,033.52	Valley of world-famed beauty; lofty cliffs; romantic vistas; many waterfalls of extraordinary height; 3 groves of Big Trees; High Sierran, Waterwheel Falls; good trout fishing.
Zion ¹ 1919	Southwestern Utah.	Cedar City, Union Pacific system; Marysville, D. & R., G. W.	Nov. 10, 1919 June 13, 1930 ²	41 Stat. 356. Public 351,718 ² Cong.	148.26	94,887.73	1,251.87	Magnificent gorge (Zion Canyon); depth from 1,500 to 2,500 feet, with precipitous walls; of great beauty and scenic interest.

¹ General information circulars on these parks may be obtained free on application.² Boundary changed.³ In Wyoming, 3,145 square miles; in Montana, 245 square miles; in Idaho, 36 square miles.

TABLE 2.—National monuments administered by the National Park Service, Department of the Interior

[Number, 32; total area, 3,724.03 square miles or 2,383,467.88 acres]

Name	Location	Approaches	When established	Statute reference	Area, acres	Private lands, acres	Special characteristics
Archaeo.....	Utah.....	Thompson, Rio Grande Western-U. S. 450 to monument.	Apr. 12, 1929	Proc. 1875.....	4,520.00	320.00	Contains extraordinary examples of wind erosion in the shape of gigantic arches, windows, and other unique formations.
Aztec Ruins ¹	New Mexico.....	Aztec, D. & R. G. W.....	Jan. 24, 1923 July 2, 1928 ²	42 Stat. 2295. 45 Stat. 2954.	17.40		Prehistoric ruin of pueblo type containing 500 rooms and other ruins. Under cone of geologically recent formation.
Capulin Mountain.....	Idaho.....	Folsom, Colorado & Southern.	Aug. 9, 1916	39 Stat. 1792.....	680.37		These ruins are one of the most noteworthy relics of a prehistoric age and people within the limits of the United States. Discovered in ruinous condition in 1694.
Casa Grande.....	Arizona.....	Florence, Southern Pacific.	Mar. 2, 1889 June 22, 1892 ² Dec. 10, 1899 Aug. 3, 1918 June 7, 1929 ²	25 Stat. 961. Executive order. 36 Stat. 2504. 40 Stat. 1818. 44 Stat. 598.	472.50		Numerous cliff-dweller ruins, including communal houses, in good condition and but little excavated. Many lofty monoliths; is wonderful example of erosion, and of great scenic beauty and interest.
Chaco Canyon.....	New Mexico.....	Thoreau, Santa Fe system.	Mar. 11, 1907 Jan. 16, 1928 ²	35 Stat. 2119. 45 Stat. 2037.	21,512.37	10,295.24	Best example of fissure lava flows; volcanic region with weird landscape effects.
Colorado.....	Colorado.....	Grand Junction, Denver & Rio Grande Western.	May 24, 1911	37 Stat. 1681.....	13,749.47		Remarkable natural rock tower, of volcanic origin, 1,200 feet in height.
Craters of the Moon.....	Idaho.....	Arco, Oregon Short Line.....	May 2, 1924 July 23, 1928 ² July 9, 1930 ²	43 Stat. 1947. 45 Stat. 2959. Proc. 1916.	49,601.90	1,579.90	Deposits of fossil remains of prehistoric animal life of great scientific interest.
Devils Tower.....	Wyoming.....	Moorecroft, Burlington route	Sept. 24, 1906	34 Stat. 3235.....	1,152.91		Enormous sandstone rock eroded in form of a castle, upon which inscriptions have been placed by early Spanish explorers. Contains cliff-dweller ruins. Of great historic, scenic, and ethnologic interest.
Dinosaur.....	Utah.....	Watson, Uintah Ry.....	Oct. 4, 1915	39 Stat. 1732.....	80.00		Area containing deposits of plant fossils.
El Morro.....	New Mexico.....	Gallup or Grant, Santa Fe system.	Dec. 8, 1906 June 18, 1917 ²	34 Stat. 3264. 40 Stat. 1673.	240.00		Site of home in which George Washington was born to be rehabilitated and replicas of the old homestead to be erected.
Fossil Cycad.....	South Dakota.....	Minnekahta, C. B. & Q.....	Oct. 21, 1922	42 Stat. 2286.....	320.00		
George Washington Birthplace.....	Virginia.....	Fredericksburg, Richmond, Fredericksburg & Potomac, thence State route No. 37 to monument.	Jan. 23, 1930	Pub. No. 34, 71st Cong.	21.73		

¹ Donated to United States.² Boundary changed.³ From June 22, 1892, until Aug. 3, 1918, classified as a national park.⁴ Estimated.

TABLE 2.—National monuments administered by the National Park Service, Department of the Interior—Continued

[Number, 32; total area, 3,724.03 square miles or 2,383,467.88 acres]

Name	Location	Approaches	When established	Statute reference	Area, acres	Private lands, acres	Special characteristics
Glacier Bay.....	Alaska.....	Juneau, by boat.....	Feb. 26, 1925	43 Stat. 1989.....	1,164,800.00		Contains tidewater glaciers of first rank.
Gran Quivira.....	New Mexico.....	Mountainair, Santa Fe.....	Nov. 1, 1909 Nov. 25, 1919 ¹	36 Stat. 2593. 41 Stat. 1778.	423.77		One of the most important of earliest Spanish missions in the Southwest. Monument also contains pueblo ruins.
Hovenweep.....	Utah and Colorado.....	Manecos, D. & R. G. W.....	Mar. 2, 1923	42 Stat. 2299.....	285.80		Four groups of prehistoric towers, pueblos, and cliff dwellings.
Katmai.....	Alaska.....	Sailing vessel from Kodiak, reached by steamship from Seattle.	Sept. 24, 1918 Sept. 5, 1923	40 Stat. 1855. Executive Order No. 3867.	1,087,990.00		Wonderland of great scientific interest in the study of volcanism. Phenomena exist upon a scale of great magnitude. Includes Valley of Ten Thousand Smokes.
Lewis and Clark Cavern. ¹	Montana.....	Temporarily closed to public.	May 11, 1908 May 16, 1911	35 Stat. 2187 37 Stat. 1679.	161.00		Immense limestone cavern of great scientific interest, magnificently decorated with stalactite formations. Now closed to public because of depredations by vandals. Prehistoric cliff-dwelling ruins of unusual size situated in a niche in face of a vertical cliff. Of scenic and ethnologic interest.
Montezuma Castle.....	Arizona.....	Clarkdale, Santa Fe system	Dec. 8, 1906	34 Stat. 3265.....	* 163.09		One of the most noted redwood groves in California. Was donated by the late Hon. William Kent, ex-Member of Congress. Located 7 miles from San Francisco.
Muir Woods ¹	California.....	Ferry from San Francisco, thence Mount Tamalpais & Muir Woods R. R.	Jan. 9, 1908 Sept. 22, 1921 ²	35 Stat. 2174. 42 Stat. 2249.	426.43		Three natural bridges, among largest examples of their kind. Largest bridge is 222 feet high, 65 feet thick at top of arch; arch is 28 feet wide span, 261 feet, height of span, 157 feet. Other two slightly smaller.
Natural Bridges.....	Utah.....	Pack trip from Blanding, Utah, reached by stage from Thompson, Utah, Manecos, Colo., stations on Denver & Rio Grande Western.	Apr. 16, 1908 Sept. 25, 1909 Feb. 11, 1916	35 Stat. 2183. 36 Stat. 2592. 39 Stat. 1764.	* 42,740.00		Contains numerous pueblos, or cliff-dweller ruins, in good preservation. Abundant archaeological value, relic of prehistoric inhabitants.
Navajo.....	Arizona.....	Gallup, N. Mex., or Flagstaff, Ariz., Santa Fe system.	Mar. 20, 1909 Mar. 14, 1912 Dec. 8, 1906	36 Stat. 2491. 37 Stat. 1733. 34 Stat. 3266.	360.00		Abundant archaeological value, relic of prehistoric inhabitants.
Petrified Forest.....	do.....	Adamsana or Holbrook, Santa Fe system.	July 31, 1911 ²	37 Stat. 1716.	25,908.40	12,792.74	Is of great scientific interest.
Pinnacles.....	California.....	Soledad or Hollister, Southern Pacific.	Jan. 16, 1908 May 7, 1923 ² July 2, 1921 ²	35 Stat. 2177. 43 Stat. 1911. 43 Stat. 1961.	2,980.26	160.00	Many spirelike rock formations, 600 to 1,000 feet high, visible, many miles; also numerous caves and other formations.
Pipe Spring.....	Arizona.....	Cedar City, Utah, Union Pacific.	May 31, 1923	43 Stat. 1913.....	40.00		Old stone fort and spring of pure water in desert region. Serves as memorial to early western pioneer life.
Rainbow Bridge.....	Utah.....	Pack trip from Navajo Mountain, Ariz., reached from Gallup, N. Mex., or Flagstaff, Ariz., Santa Fe system.	May 30, 1910	36 Stat. 2703.....	160.00		Unique natural bridge of great scientific interest and symmetry. Height 309 feet above water, and span is 278 feet, in shape of rainbow.
Scotts Bluff.....	Nebraska.....	Gering, Union Pacific.....	Dec. 12, 1919 May 9, 1924 ²	41 Stat. 1779. Executive order No. 4008.	1,893.83	129.70	Region of historic and scientific interest. Many famous old trails traversed by the early pioneers in the winning of the West passed over and through this monument. Cavern of considerable extent, near Cody, not open to visitors at present.
Shoshone Cavern.....	Wyoming.....	Cody, Burlington route.....	Sept. 21, 1909	36 Stat. 2561.....	210.00		Area of great natural beauty and historic interest as scene of massacre of Russians by Indians. Contains 16 totem poles of best native workmanship.
Sitka.....	Alaska.....	Port of call for steamships from Seattle.	Mar. 23, 1910	36 Stat. 2601.....	57.00		Ruin of Franciscan mission dating from seventeenth century. Being restored by National Park Service as rapidly as funds permit.
Tumacacori.....	Arizona.....	Calabasas, Southern Pacific, and El Paso & Southern.	Sept. 15, 1908	35 Stat. 2265.....	10.00		Includes Crowhigh Butte, from which Explorer Verendrye first beheld territory beyond the Missouri River.
Verendrye.....	North Dakota.....	Sanish, Soo Line.....	June 29, 1917	40 Stat. 1677.....	250.04		Prehistoric dwellings of ancestors of Hopi Indians.
Wupatki.....	Arizona.....	Flagstaff, Santa Fe system.....	Dec. 9, 1924	43 Stat. 1977.....	2,234.10	320.00	Located on eastern slope of Sleeping Ute Mountain. Is pile of masonry of great archaeological value, relic of prehistoric inhabitants.
Yucca House ¹	Colorado.....	Manecos, Denver & Rio Grande Western.	Dec. 19, 1919	41 Stat. 1781.....	9.60		Colonial historic lands.
Colonial.....	Virginia.....		Dec. 30, 1900	July 3, 1930. Proc. Pub. No. 1929.			

¹ Donated to United States.² Boundary changed.

* Estimated.

TABLE 3.—National monuments administered by the Department of Agriculture

[Number, 16; total area, 596.22 square miles or 381,185 acres]

Name	Location	Approaches	When established	Statute reference	Area, acres	Special characteristics
Bandelier.....	New Mexico.....	Santa Fe, Santa Fe system, and Denver & Rio Grande Western.	Feb. 11, 1916	39 Stat. 1764.....	22,075	Vast number of cliff-dweller ruins of unusual ethnological and educational interest, including ruins of Rito de los Frijoles, Otowi, Tankawi, and others. Some of the tools, implements, and simple household equipment of the former inhabitants have been restored as they were centuries ago.
Chiricahua.....	Arizona.....	Wilcox, Southern Pacific.	Apr. 18, 1924	43 Stat. 1946.....	4,480	Natural rock formations—pillars, balanced rocks, and formations resembling animals, faces, etc.
Devils Postpile.....	California.....	Laws, Southern Pacific, thence stage to Mammoth.	July 6, 1911	37 Stat. 1715.....	800	Consists of peculiar hexagonal basaltic columns, like an immense pile of posts. The columns lie in the pile at all angles from vertical to almost horizontal. Said to rank with famous Giant's Causeway of Ireland.
Gila Cliff Dwellings.....	New Mexico.....	Silver City, via Pinos Altos, Santa Fe system.	Nov. 16, 1907	35 Stat. 2162.....	160	Cliff-dweller ruins. Four natural cavities in the face of an overhanging cliff 150 feet high, of a grayish-yellow volcanic formation, are divided into small rooms by walls built of adobe and small stones, which are in a good state of preservation. The ruins are situated in rough and broken country and are accessible only by trail.
Holy Cross.....	Colorado.....	Redcliff, Denver & Rio Grande.....	May 11, 1929	Proc. 1877.....	1,392	2 crevices on side of Mount of the Holy Cross, which when filled, or partially filled, with snow form a figure in the shape of a Greek cross.
Jewel Cave.....	South Dakota.....	Custer, Burlington route.	Feb. 7, 1908	35 Stat. 2180.....	11,290	Object of much public and religious interest.
Lava Beds.....	California.....	Mount Hebron, Southern Pacific.	Nov. 21, 1925	44 Stat. 2591.....	45,967	Cavern of limestone formation. Consists of a series of chambers, connected by narrow passages, with numerous side galleries.
Lehman Caves.....	Nevada.....	Ely, Nevada Northern.....	Jan. 24, 1922	42 Stat. 2260.....	593	Unusual and unique exhibits of volcanic action and lava flows in the shape of peculiar lava caves and tunnels in great numbers and of considerable size. In many of these caves rivers of perpetual ice are found and Indian petroglyphs carved and painted upon their walls indicate possible occupancy by early historic and prehistoric races. Battle ground of Modoc Indian war of 1873.
Mount Olympus.....	Washington.....	Port Angeles by ferry from Seattle.	Mar. 2, 1909 Apr. 17, 1912 May 11, 1915	35 Stat. 2247..... 37 Stat. 1737..... 39 Stat. 1726.....	208,730	Caves of light-gray and white limestone, honey-combed by tunnels and galleries of stalactite formations.
Old Kasaan.....	Alaska.....	Steamships, Seattle to Ketchikan.	Oct. 25, 1916	39 Stat. 1812.....	38	Contains many objects of unusual scientific interest, including numerous glaciers. It is a real wilderness area, having no settlements, no supply points, nor human habitations within it. Bands of the rare Roosevelt elk, numbering several thousand head, of a species native to the region and not found elsewhere, have their summer feeding grounds within the monument area.
Oregon Caves.....	Oregon.....	Grants Pass, Southern Pacific.....	July 12, 1909	36 Stat. 2497.....	480	Abandoned Haida Indian village in which remain totem poles, grave houses and monuments, and portions of the original framework of the buildings.
Sunset Crater.....	Arizona.....	Flagstaff, Santa Fe system.....	May 26, 1930	Proc. No. 1911.....	3,040	Caves in limestone formation of great variety and beauty. These assume odd, grotesque and fantastic forms of considerable extent and are situated in an attractive environment.
Timpanogos Cave.....	Utah.....	American Fork, Union Pacific system; D. & R. G. W.	Oct. 14, 1922	42 Stat. 2285.....	250	A volcanic crater with lava flows and ice caves, near famous San Francisco Peaks.
Tonto.....	Arizona.....	Globe, Southern Pacific.....	Dec. 19, 1907	35 Stat. 2168.....	1,640	Limestone cavern. The cave is almost 600 feet in length. Many beautiful effects are emphasized by the electric lights installed in the cave.
Walnut Canyon.....	.....do.....	Flagstaff, Santa Fe system.....	Nov. 30, 1915	39 Stat. 1761.....	960	Two cliff-dwellers ruins jut off the Roosevelt Globe Highway, one to the southwest of the road and the other on the west side of the canyon. They consist of 2 and 3 storied walls of adobe with the supporting beams and lintels of windows and low doors still in place.
Wheeler.....	Colorado.....	Wagon Wheel Gap or Creede, Denver & Rio Grande Western.	Dec. 7, 1908	35 Stat. 2214.....	300	Contains cliff dwellings of marked scientific and popular interest built in under the outward sloping canyon walls, utilizing the projecting limestone ledges as foundations. Instead of being of the communal type, these cliff houses were apparently built for separate families and contain from 6 to 8 rooms.

¹ Estimated.

TABLE 6.—Visitors to the national parks, 1915-1930

Name of park	1915	1916	1917	1918	1919	1920	1921	1922
Acadia ¹					¹ 64,600	¹ 66,500	¹ 69,836	73,779
Crater Lake	11,371	12,265	11,645	13,231	16,645	20,135	26,617	33,616
General Grant	10,523	15,360	17,360	15,496	21,574	19,661	30,312	50,436
Glacier	14,255	12,859	18,387	9,063	18,356	22,449	19,736	23,935
Grand Canyon	(²)	(²)	(²)	(²)	37,745	67,315	67,485	84,700
Hawaii	(³)	(³)	(³)	(³)	(³)	116,071	27,759	
Hot Springs	¹ 115,000	¹ 118,740	¹ 135,000	¹ 140,190	¹ 160,490	¹ 162,750	¹ 130,968	¹ 106,164
Lassen Volcanic			¹ 8,500	¹ 2,000	¹ 2,500	¹ 10,000	¹ 10,000	
Mesa Verde	663	1,385	2,223	2,058	2,287	2,880	3,003	4,251
Mount McKinley			(⁴)	(⁴)	(⁴)	(⁴)	(⁴)	7
Mount Rainier	33,166	23,869	35,498	43,901	55,232	56,491	55,771	70,371
Platt	¹ 20,000	¹ 30,000	¹ 35,000	14,431	26,312	¹ 70,000	¹ 70,000	
Rocky Mountain	¹ 51,000	¹ 51,000	117,186	101,497	169,492	240,966	273,737	¹ 219,146
Sequoia	7,617	10,780	18,510	15,003	30,443	31,598	28,265	27,314
Sullys Hill	¹ 1,000	¹ 1,000	2,207	4,188	4,026	9,341	9,100	¹ 9,548
Wind Cave	2,817	9,000	16,742	36,000	25,000	38,000	28,336	31,616
Yellowstone	51,865	35,849	53,400	21,275	62,361	78,777	81,631	88,223
Yosemite	33,452	33,300	34,510	33,497	55,362	68,906	91,513	100,506
Zion						3,062	2,997	4,100
Total	334,799	356,007	488,268	451,661	755,325	919,504	1,007,335	1,044,502

Name of park	1923	1924	1925	1926	1927	1928	1929	1930
Acadia ¹	64,200	71,708	73,673	101,256	123,699	134,897	149,554	154,734
Byrre Canyon							21,997	55,982
Carlsbad Caverns ⁴								90,104
Crater Lake	33,017	64,312	65,018	56,019	82,354	113,325	128,435	157,663
General Grant	46,230	35,020	40,517	47,996	51,988	44,783	53,547	
Glacier	3,988	33,372	40,063	37,323	41,745	33,454	70,742	73,776
Grand Canyon	162,166	108,256	134,053	140,252	162,356	167,226	184,063	172,763
Grand Teton							¹ 61,500	¹ 60,000
Hawaii	¹ 11,150	¹ 12,110	¹ 64,155	¹ 35,000	¹ 57,551	¹ 78,414	109,857	167,092
Hot Springs	¹ 112,000	¹ 164,175	¹ 205,500	¹ 260,000	¹ 184,325	¹ 199,099	184,517	167,092
Lassen Volcanic	¹ 9,500	¹ 12,000	¹ 12,056	18,739	20,089	26,057	26,106	31,755
Mesa Verde	5,296	7,100	9,043	11,459	11,915	16,700	14,517	16,656
Mount McKinley	34	62	206	233	651	802	1,038	991
Mount Rainier	127,708	134,473	173,004	161,760	200,651	219,531	217,783	265,620
Platt	¹ 117,710	¹ 134,874	¹ 143,380	¹ 124,284	¹ 204,554	¹ 280,638	¹ 204,308	¹ 178,188
Rocky Mountain	218,000	224,211	233,912	225,627	229,862	235,027	274,408	253,871
Sequoia	30,158	34,468	46,677	46,404	100,684	98,053	111,385	129,221
Sullys Hill	8,478	8,635	9,183	19,921	22,632	24,979	21,001	21,293
Wind Cave	41,305	52,166	60,267	85,466	81,025	100,300	108,943	88,600
Yellowstone	138,352	144,128	154,282	187,507	200,825	230,084	260,697	227,901
Yosemite	130,046	105,804	209,166	273,209	490,430	460,619	461,257	458,566
Zion	6,408	8,400	16,817	21,964	24,303	30,016	35,383	55,297
Total	1,280,886	1,422,353	1,700,512	1,930,865	2,354,613	2,522,188	2,680,897	2,774,361

¹ Formerly Lafayette National Park.² Estimated.³ No record.⁴ Indicated loss in travel from 1921 due largely to better methods of checking and estimating employed.⁵ Actual park visitors; some miners and prospectors also passed through park.⁶ National park established by act of May 14, 1930. Formerly a national monument.TABLE 7.—Visitors to the national monuments, 1925-1930¹

Name	1925	1926	1927	1928	1929	1930
Ancher (Utah)						¹ 500
Archeo Ruins (New Mexico)	² 7,000	5,646	7,298	18,359	18,193	12,900
Capulin Mountain (New Mexico)	² 7,000	14,965	12,617	¹ 7,400	¹ 12,000	¹ 16,500
Carlsbad Cave (New Mexico)	² 7,000	10,804	26,436	46,333	78,822	(³)
Casa Grande (Arizona)	13,587	16,442	28,818	28,274	37,244	26,656
Chaco Canyon (New Mexico)	² 2,000	² 2,000	¹ 1,500	¹ 1,235	¹ 2,750	² 2,000
Colorado (Colorado)	² 9,000	² 9,000	¹ 5,500	¹ 10,000	¹ 12,000	¹ 13,000
Crozier of the Moon (Hawaii)	3,349	4,620	5,171	7,708	7,730	7,365
Devils Tower (Wyoming)	8,450	16,640	¹ 10,400	8,400	¹ 12,000	12,730
El Morro (New Mexico)	¹ 1,800	5,794	5,178	5,356	2,625	¹ 3,000
George Washington Birthplace (Virginia)	¹ 1,000	1,577	2,034	2,779	3,357	¹ 10,000
Gran Quivira (New Mexico)	² 250	² 250	203	240	440	¹ 700
Hovenweep (Utah-Colorado)	² 250	² 250	253	240	440	¹ 700
Mesa Verde (Colorado)	¹ 9,000	12,385	15,400	16,252	17,824	19,298
Muir Woods (California)	36,643	97,426	103,514	103,571	95,358	77,311
Natural Bridges (Utah)		68	82	175	240	¹ 300
Navajo (Arizona)	² 200	² 250	260	315	965	215
Papago Saguro (Arizona)	² 30,000	² 53,000	60,540	66,450	¹ 87,600	¹ 50,000
Petrified Forest (Arizona)	55,227	53,945	61,761	75,225	69,350	100,453
Pinnacles (California)	¹ 10,000	10,167	11,265	13,216	16,796	11,862
Pipe Spring (Arizona)	¹ 4,000	16,728	16,833	17,421	24,883	8,765
Rainbow Bridge (Utah)	² 250	² 300	² 300	² 450	² 450	² 450
Scotts Bluff (Nebraska)	² 24,000	² 27,000	¹ 30,000	¹ 37,500	¹ 42,500	¹ 48,500
Shoshone Cavern (Wyoming)	² 2,500	² 3,000	¹ 3,000	¹ 3,500	¹ 3,500	¹ 3,000
Sitka (Alaska)	² 10,500	13,683	16,761	17,341	18,250	15,603
Tumacacori (Arizona)	¹ 1,000	18,000	¹ 15,000	¹ 15,000	¹ 11,500	¹ 8,000
Venezkyrie (North Dakota)	² 500	² 600	² 450	² 500	² 550	² 604
Wupatki (Arizona)	¹ 100	¹ 150	196	174	220	¹ 240
Yucca House (Colorado)						
Total	294,050	384,040	443,197	502,656	567,667	472,095

¹ No records for other national monuments.² Estimated.³ Made a national park by act of Congress approved May 14, 1930.⁴ National monument status of Papago Saguro abolished by act of Congress approved Apr. 7, 1930.

TABLE 8.—Summary of appropriations for the administration, protection, and improvement of the national parks and national monuments, together with the revenues received, for the fiscal years 1917-1931, inclusive

Year	Department	Appropriation	Revenues
1917	Interior Department.	\$337,306.67	
	War Department.	217,200.00	
1918	Interior Department.	530,680.00	
	War Department.	217,500.00	
			748,180.00
1919	Interior Department.	965,105.00	
	War Department.	50,000.00	
1920		1,013,105.00	196,678.03
1921		967,070.76	316,877.96
1922		1,038,965.16	360,628.27
1923		1,433,220.00	432,961.80
1924		1,446,520.00	513,708.36
1925		1,892,601.00	693,886.32
1926		3,027,657.00	670,620.98
1927		2,238,400.00	826,434.17
1928		3,698,920.00	703,849.60
1929		4,880,685.00	808,255.81
1930		4,574,015.00	849,272.95
1931		7,818,817.18	1,015,740.56
		9,969,185.00	

¹ For summary of appropriations and revenues prior to 1917 see 1920 Annual Report, p. 359.² The revenues from the various national parks were expendable during the years 1904 to 1918, inclusive, with the exception of those received from Crater Lake, Mesa Verde, and Rocky Mountain National Parks, the revenues from which were turned into the Treasury to the credit of miscellaneous receipts.

FOREST SERVICE

TABLE 1.—National forest receipts from all sources in the public-land States, the amounts paid therefrom to the States, the amounts transferred to the road and trail fund, and the balance

State	Total net receipts	Paid to States		Transferred to road and trail fund, act Mar. 4, 1913	Balance
		Act June 26, 1910	Act May 23, 1908		
Arizona.....	\$254,792.17	\$25,377.30	\$57,353.72	\$22,941.49	\$149,119.66
California.....	1,165,751.00	291,427.75	116,575.10	757,738.15	
Colorado.....	402,377.68	100,594.42	40,237.77	261,545.49	
Idaho.....	545,212.86	136,303.21	54,521.28	354,388.37	
Montana.....	205,291.59	51,322.90	20,529.16	133,439.53	
Nevada.....	93,770.88	23,444.97	9,377.99	60,956.92	
New Mexico.....	128,280.27	821.64	31,888.66	12,755.86	\$2,913.11
Oregon.....	737,175.60	189,263.90	75,717.56	492,164.14	
South Dakota.....	115,696.23	28,924.81	11,569.92	75,201.50	
Utah.....	186,497.03	46,624.26	18,649.70	121,223.07	
Washington.....	699,201.36	152,300.34	69,920.14	386,960.88	
Wyoming.....	294,406.48	51,102.37	20,440.95	132,866.16	
Total.....	4,698,568.15	26,198.94	1,168,592.31	464,295.92	\$3,017,520.98
FISCAL YEAR 1928					
Arizona.....	\$352,698.05	\$35,028.19	\$79,409.96	\$31,703.09	\$306,465.91
California.....	1,390,201.44	340,030.10	139,842.87	136,020.01	884,308.30
Colorado.....	415,371.49	103,842.87	41,537.15	269,991.47	
Idaho.....	678,823.40	169,705.85	67,882.34	441,235.21	
Montana.....	215,551.01	53,887.75	21,555.10	140,108.16	
Nevada.....	88,349.69	22,087.42	8,834.97	57,427.30	
New Mexico.....	130,568.59	796.47	32,443.63	12,977.21	\$84,351.88
Oregon.....	686,696.92	171,631.73	68,660.69	446,294.50	
South Dakota.....	125,154.46	31,288.02	12,515.44	81,350.40	
Utah.....	198,865.85	49,701.46	19,880.58	129,223.81	
Washington.....	576,011.88	144,062.97	57,601.19	374,407.72	
Wyoming.....	255,147.95	65,056.96	25,215.78	165,866.11	
Total.....	5,080,289.63	35,854.66	1,261,108.72	504,443.48	\$3,278,882.77
FISCAL YEAR 1929					
Arizona.....	\$410,965.03	\$40,400.81	\$92,648.56	\$37,039.42	\$340,886.24
California.....	1,446,424.41	359,673.13	144,642.41	97,173.87	944,530.99
Colorado.....	408,861.12	124,715.29	49,886.12	324,259.75	
Idaho.....	627,712.50	156,958.12	62,771.25	408,034.13	
Montana.....	293,853.57	65,968.89	29,387.56	171,519.12	
Nevada.....	92,523.09	23,130.77	9,252.31	60,140.01	
New Mexico.....	148,349.59	842.10	34,576.57	13,460.75	\$99,470.27
Oregon.....	1,090,103.88	265,025.97	106,010.39	689,067.52	
South Dakota.....	171,953.08	42,988.27	17,195.31	111,769.50	
Utah.....	205,148.21	51,287.05	20,514.82	133,346.34	
Washington.....	671,117.14	167,779.28	67,111.71	436,226.15	
Wyoming.....	297,785.61	74,439.40	29,785.76	193,560.45	
Total.....	5,806,901.27	41,242.91	1,456,414.87	582,565.84	\$3,786,677.95

TABLE 2.—Grazing receipts by States, the amounts paid therefrom to the States, and the amounts transferred to the general fund in the Treasury

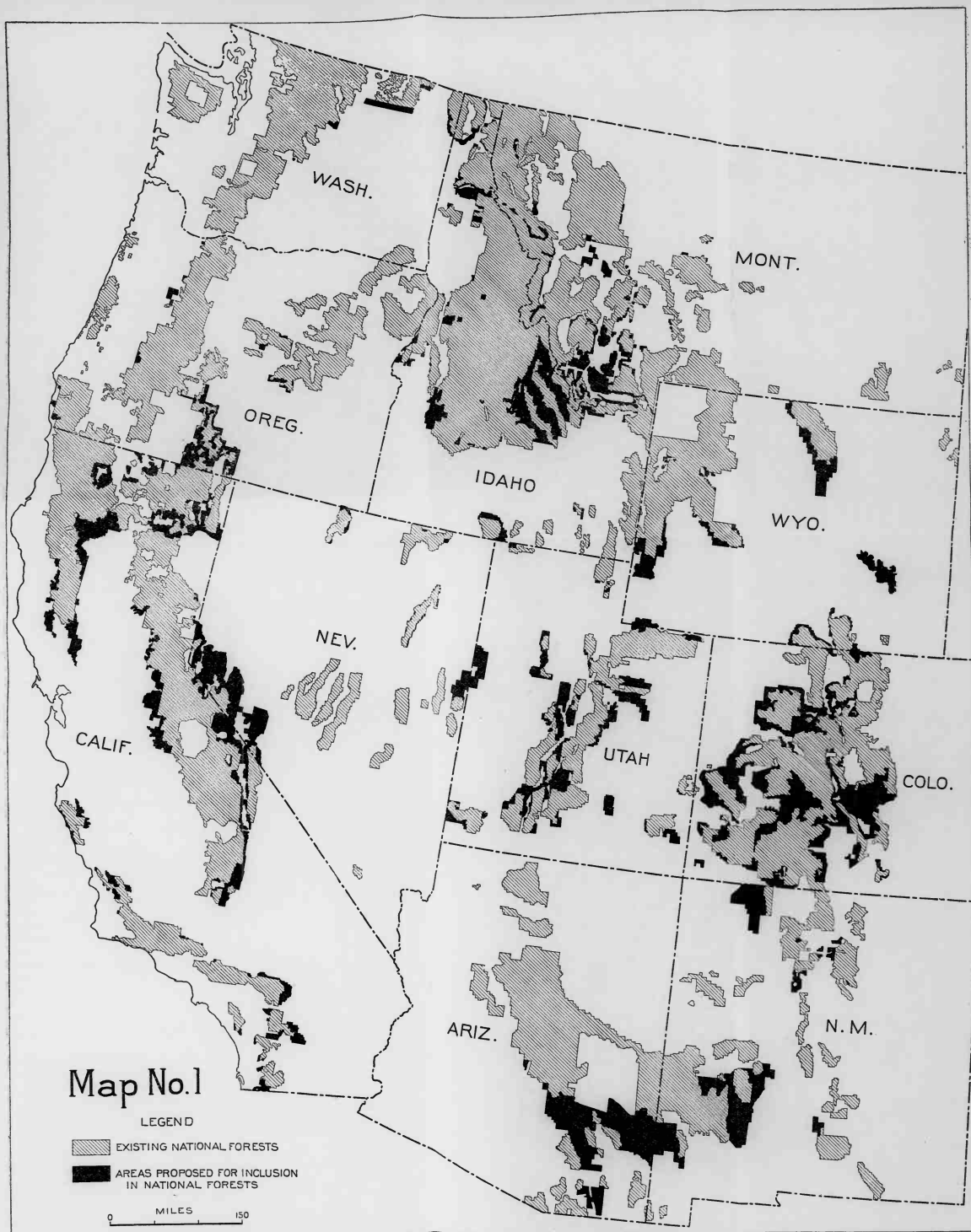
State	Grazing receipts	Paid States under act of May 23, 1908		Paid school fund, Arizona and New Mexico, act of June 20, 1910	Transferred to general fund in Treasury
Alabama.....	\$76.90	\$19.23			\$57.67
Arizona.....	112,052.80	25,223.09	\$11,160.46		75,669.25
Arkansas.....	130.28	520.98			390.72
California.....	173,970.65	43,492.66			130,477.97
Colorado.....	271,271.76	67,817.94			203,453.82
Florida.....	340.38	35.10			305.28
Georgia.....	137.94	34.49			103.45
Idaho.....	206,195.91	51,548.98			154,646.93
Maine.....	8.38	2.15			6.23
Montana.....	121,885.04	30,471.26			91,413.78
Nebraska.....	10,925.36	2,731.34			8,194.02
New Hampshire.....	86,804.20	21,701.65			65,102.55
New Mexico.....	113.61	28.40			85.21
New York.....	86,024.90	21,368.89	\$50.56		64,105.75
North Carolina.....	396.15	96.04			300.11
Oklahoma.....	3,163.25	790.81			2,372.44
Oregon.....	132,709.80	33,192.45			99,517.35
South Carolina.....	31.33	7.83			23.50
South Dakota.....	16,301.81	4,097.85			12,203.96
Tennessee.....	186.08	46.52			139.56
Utah.....	164,997.35	41,249.24			123,748.01
Virginia.....	641.35	160.34			481.01
Washington.....	37,480.43	9,370.11			28,110.32
West Virginia.....	417.82	104.46			313.36
Wyoming.....	104,148.10	26,037.63			78,110.47
Total.....	1,530,952.46	379,810.41	11,711.02		1,139,431.03
FISCAL YEAR 1928					
Alabama.....	\$40.38	\$10.10			\$30.28
Arizona.....	169,421.95	38,145.25	\$16,840.54		114,436.06
Arkansas.....	206.94	51.74			155.20
California.....	181,836.77	45,456.69			136,379.08
Colorado.....	279,012.69	69,733.17			209,279.52
Florida.....	362.44	125.61			236.83
Georgia.....	172.56	43.14			129.42
Idaho.....	242,825.02	60,706.25			182,118.76
Maine.....	14.70	3.68			11.02
Montana.....	132,476.19	33,119.05			99,357.14
Nebraska.....	10,273.66	2,688.66			7,585.00
New Hampshire.....	80,364.13	20,091.63			60,272.50
New Mexico.....	200.14	50.04			150.10
New York.....	70.70	19.18			51.52
New Mexico.....	95,082.26	23,774.65	\$83.66		71,323.95
North Carolina.....	364.19	91.65			272.54
Oklahoma.....	3,394.86	848.72			2,546.14
Oregon.....	151,278.25	37,810.66			113,467.59
South Carolina.....	60.34	15.09			45.25
South Dakota.....	15,147.10	3,786.78			11,360.32
Tennessee.....	170.29	40.67			130.22
Utah.....	178,960.00	44,740.00			134,220.00
Virginia.....	517.59	129.80			387.79
Washington.....	40,330.32	10,067.28			30,263.04
West Virginia.....	347.21	86.80			260.41
Wyoming.....	130,051.29	32,512.82			97,538.47
Total.....	1,713,730.15	424,076.52	17,424.20		1,272,229.43

82 CONSERVATION AND ADMINISTRATION OF PUBLIC DOMAIN

TABLE 2.—Grazing receipts by States, the amounts paid therefrom to the States, and the amounts transferred to the general fund in the Treasury—Continued

FISCAL YEAR 1929

State	Grazing receipts	Paid States under act of May 23, 1908	Paid school fund, Arizona and New Mexico, act of June 20, 1910	Transferred to general fund in Treasury
Alabama.....	\$9.60	\$2.40		\$7.21
Arizona.....	149,106.96	33,612.44	\$14,657.21	100,837.30
Arkansas.....	176.40	44.10		132.30
California.....	190,904.34	47,728.08		143,176.26
Colorado.....	322,296.90	80,574.22		241,722.68
Florida.....	227.41	56.88		170.53
Georgia.....	138.36	34.59		103.77
Idaho.....	225,076.81	56,209.20		168,867.61
Maine.....	15.69	3.92		11.77
Montana.....	129,817.64	34,954.41		104,863.23
Nebraska.....	9,411.98	2,352.99		7,058.99
Nevada.....	84,007.72	21,001.93		63,005.79
New Hampshire.....	216.35	54.09		162.26
New Mexico.....	91,881.33	22,832.51	551.29	68,497.53
North Carolina.....	296.30	96.57		199.73
Oklahoma.....	3,137.19	784.30		2,352.89
Oregon.....	156,970.60	39,242.65		117,727.95
South Carolina.....	31.14	7.78		23.36
South Dakota.....	18,185.71	4,546.43		13,639.28
Tennessee.....	162.43	40.61		121.82
Utah.....	174,606.51	43,651.62		130,954.89
Virginia.....	509.78	127.44		382.34
Washington.....	42,716.98	10,679.24		32,037.74
West Virginia.....	382.98	95.74		287.24
Wyoming.....	130,032.70	32,508.17		97,524.53
Total.....	1,740,289.81	431,270.31	15,208.50	1,293,811.00



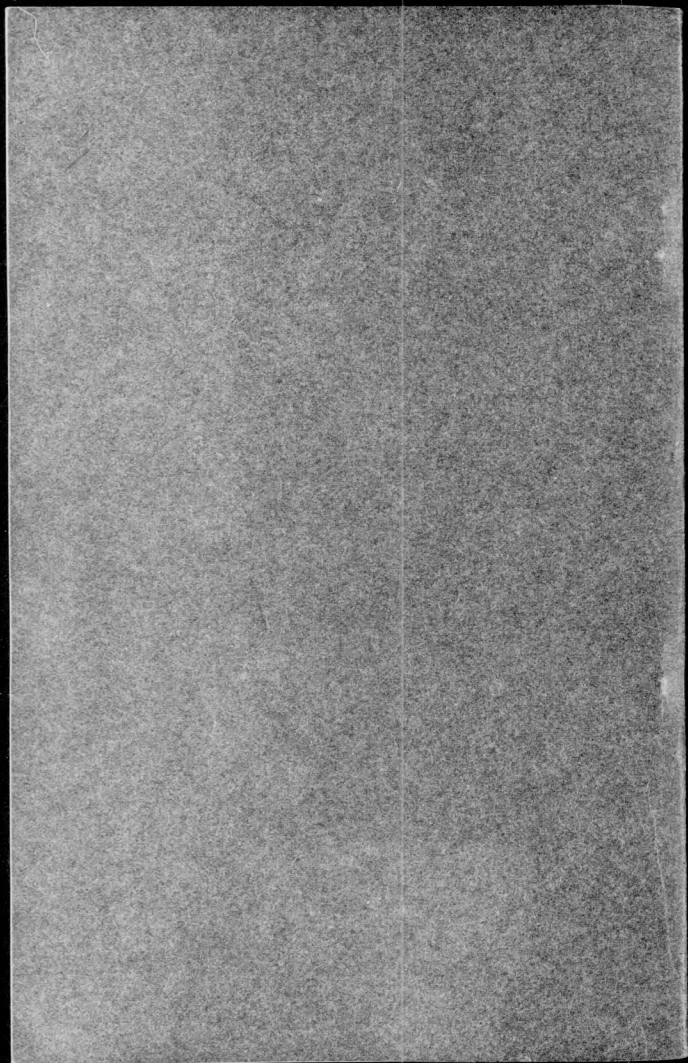
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**END OF
TITLE**